



Algorithmic discrimination as a form of structural discrimination: Standards of the Inter-American Court of Human Rights related to vulnerable groups and the challenges to judicial review related to structural injunctions¹

Mônia Clarissa Hennig Leal*
Dérique Soares Crestane**

ABSTRACT: In the era of the “information society”, many aspects of analogic life are migrating to the virtual space. Personal, educational, and professional relationships are becoming digital or hybrid. Although there are many conveniences in the virtual world, new dangers also arise, such as algorithmic discrimination. This occurs when the decision to grant or deny access to goods and services is made by an opaque or non-transparent algorithm. In this context, the following question arises: how can structural injunctions provide a basis for creating standards of protection in the face of legislative insufficiency and jurisdictional standards that confront algorithmic discrimination as a reproduction of structural discrimination? To this end, the hypothetical-deductive approach, analytical procedure method, and bibliographic research technique were used. Thus, in the first part

¹ This article is a result of the “Essentiality theory” (*Wesentlichkeitstheorie*) and algorithmic discrimination: protection standards established by the Brazilian Federal Supreme Court (STF) and by the Inter-American Court of Human Rights (IACHR) – a proposal of parameters of control” research project, sponsored by the National Council of Research and Development – CNPq (Process 309115/2021-3). It is also linked with the international cooperation Project related to the “Observatory of Latin American Judicial Review”, sponsored by Capes (Process 88881.1375114/2017-1 and Process 88887.137513/2017-00). All quotations in this article of works not originally written in English have been freely translated by the authors.

* PhD degree granted by the Ruprecht-Karls University Heidelberg (Germany). Professor and coordinator of the Master’s and Doctoral Programme in Law at the University of Santa Cruz do Sul – UNISC (Brazil). Researcher of the National Council of Research and Development – CNPq.

** PhD candidate at the Master’s and Doctoral Programme in Law at the University of Santa Cruz do Sul- UNISC (Brazil). Holder of the PROSUC/CAPES sponsorship. Member of the Research Group “Open judicial review”, coordinated by Professor Mônia Clarissa Hennig Leal.

of this article, structural discrimination is contextualised, with special emphasis on the standards established by the Inter-American Court of Human Rights. Next, the phenomenon of algorithmic discrimination and its relationship with historically observed structural discrimination in society are addressed. Finally, the possibility of using structural injunctions to provide Courts with an analysis of the phenomenon of algorithmic discrimination and formulate minimum standards to be observed by actors involved in the development of algorithms, especially those of artificial intelligence (AI), is examined. The conclusion is that structural injunctions adopted by Courts seeking to attack the roots of discrimination, especially those related to vulnerable groups, are an important tool to prevent algorithmic discrimination, as well as that the standards related to the protection of these groups established by the Inter-American Court of Human Rights should be taken as parameters for legislation and regulation of the use of AI.

KEYWORDS: *Structural discrimination – Inter-American Court of Human Rights – algorithmic discrimination – structural injunctions.*

1. Introduction

In the age of the “information society”, many aspects of analogic life are migrating to virtual life. Personal, educational and professional relationships are becoming digital or hybrid. While there are many facilities in the virtual world, there are also new dangers, such as algorithmic discrimination. This occurs when the decision to grant or deny access to goods and services is taken by an opaque or non-transparent algorithm.

The typical legislative process has proven so far to be unable to keep pace with technological innovations, and many supreme courts have yet to handle cases involving algorithmic discrimination. From this perspective, structural injunctions emerge as a possibility to deal with complex issues that involve a broader comprehension of the social, economic, and cultural aspects involved in the particular case, focusing on the roots of the structural aspects of the problem.

In this context, the following question arises: how can structural injunctions provide a basis for the creation of protection standards regarding algorithmic discrimination as a reproduction of structural discrimination? To this end, the hypothetical-deductive method of approach, the method of analytical procedure, and the technique of bibliographical research will be used.

At first, structural discrimination will be contextualised, with special emphasis on the standards established by the Inter-American Court of Human Rights (“IACHR”). In a second moment, the phenomenon of algorithmic discrimination and its relationship with structural discrimination historically observed in society related to vulnerable groups will be approached. Finally, the possibility of using structural injunctions to provide the Judiciary with an analysis of the phenomenon of algorithmic discrimination and to formulate standards to be observed by the actors involved in the development of algorithms, especially those of AI, will be examined.

2. Structural discrimination as an element of algorithmic discrimination: some theoretical approaches

Technological evolution has reached its highest point in today’s society. However, in relation to social conscience, the recognition of the existing plurality in

human relationships has not yet evolved the same way and continues to marginalise vulnerable groups and minorities, who demand social inclusion and the recognition of their right to equality. The existence of these groups is a problem resulting from human nature, which uses individual traits to discriminate against certain groups. It is up to the State and also to the international organisms – in a perspective of multilevel protection of human and fundamental rights – to identify these individual traits, promote the education of citizens and create inclusive norms, in order to achieve equality through the concrete protection of society members who historically have suffered oppression.²

Although the terms “*vulnerable groups*” and “*minorities*” are often used interchangeably, they have different meanings. Both need protection, but the State’s protective duty must be different for each of them, so as to not aggravate discrimination. Vulnerable groups do not have an identified trait common to all members and are composed of people in general, such as consumer groups, criminal defendants, among others. Minorities, on the other hand, have a common cultural trait among all their members, such as ethnic, racial, religious, sexual minorities, among others.³ The difference in terminology also lies in the objective: vulnerable groups seek to exercise their rights, while minorities first seek to recognise that they also have rights, and only then seek to guarantee the exercise of those rights.⁴

In this context, Fraser⁵ deals with equality as recognition. The author argues that justice requires not only redistributive practices, but also the recognition of members of vulnerable groups as holders of rights. Economic deprivation and cultural disrespect are intertwined, and the mutual sustainability of these two factors results in the historical reproduction of discrimination. While economic deprivation and cultural disrespect are closely related, the solutions to both problems are different. Economic injustice can be remedied through political and economic restructuring, including redistribution policies and affirmative action.⁶ Meanwhile, cultural injustice related to minorities can be remedied through recognition, which can include valuing cultural diversity and transforming social representations. The objective, in fact, is to change people’s perception about their “self”.⁷ In this perspective, vulnerable groups that suffer social and economic injustice and exclusion claim for equality, for reducing the inequalities; while minorities, related to cultural oppression and exclusion, ask for pluralism and the right to be different.

According to Carbonell,⁸ cultural minorities can be defined as groups of people who, regardless of whether they represent a greater or lesser number than

² Dirceu Pereira Siqueira and Lorena Roberta Barbosa Castro, “Minorias e grupos vulneráveis: a questão terminológica como fator preponderante para uma real inclusão social”, *Revista Direitos Sociais e Políticas Públicas (UNIFAFIBE)*, v. 5, no 1 (2017): 109, accessed July 17, 2023, <https://doi.org/10.25245/rdspv.v5i1.219>.

³ Siqueira and Castro, “Minorias e grupos vulneráveis”, 110-111.

⁴ Siqueira and Castro, “Minorias e grupos vulneráveis”, 114-115.

⁵ Nancy Fraser, “Da redistribuição ao reconhecimento? Dilemas da justiça numa era ‘pós-socialista’”, trans. Júlio de Assis Simões, *Cadernos de Campo (São Paulo – 1991)*, v. 15, no. 14-15 (2006): 231-232, accessed July 17, 2023, <https://doi.org/10.11606/issn.2316-9133.v15i14-15p231-239>.

⁶ Roberto Saba “Des(Igualdad) estructural”, *Revista Derecho y Humanidades*, no. 11 (2005): 135, accessed July 17, 2023, <https://derechoyhumanidades.uchile.cl/index.php/RDH/article/view/17057>.

⁷ Fraser, “Da redistribuição ao reconhecimento”, 232.

⁸ Miguel Carbonell, “Constitucionalismo, minorias y derecho”, *Isonomia Revista de Teoría y Filosofía del Derecho*, no 12 (2000): 98, accessed July 17, 2023, https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-02182000000100095.

others, find themselves in a position of disadvantage or subordination in society for historical reasons (economic, political, racial, sexual, ethnic, linguistic, among others). Each minority has its own cultural identity, such as origin for ethnic minorities, skin colour for racial minorities and sexual orientation for sexual minorities. Despite the differences, all of them share four common elements: i) the position of non-domination in society, ii) a subjective bond of solidarity between its members, with the aim of protecting their cultural identity, iii) the need for special State protection; and iv) the oppression of other members of society.⁹

These aspects also appear in the paradigmatic opinion of Judge Eduardo Ferrer Mac-Gregor in the case *Trabalhadores da Fazenda Brasil Verde v. Brazil*,¹⁰ where structural discrimination is conceived as: i) a group of people with immutable or unchangeable characteristics by their own will or related to historical factors of discriminatory practices (this group may be a minority or majority in numerical terms); ii) a systematic and historical situation of exclusion, marginalisation or subordination that prevents them from having access to basic conditions of human development; iii) discrimination is often supported by society, this is, there is no consensus on the recognition of the right; and iv) people belonging to these groups are victims of indirect discrimination or *de facto* discrimination.

The existence of systematically discriminated groups requires a response from national and supranational legal systems to protect the human and fundamental rights involved.¹¹ However, to guarantee real equality, it is necessary to reformulate traditional legal tools, since the mere provision of equality rights is not enough for vulnerable groups and minorities to have the same opportunities.¹²

Traditional constitutional approaches have not been able to recognise and protect the coexistence of different cultures within the same State. Since the emergence of constitutionalism, the counter majoritarian nature of constitutional texts aims to establish a limit to the power of political majorities, even if not necessarily numerical ones, in the decision-making process. The possible responses of legal systems to multicultural and inclusive approaches involve the distinction between the concepts of differences and inequalities. Differences correspond to specific traits that differentiate and individualise people and are protected by human and fundamental rights. Inequalities, on the other hand, refer to systematic and structural injustices that deprive certain groups of rights and opportunities.¹³

The classic concept of discrimination implies comparing the situation of one or more persons in relation to access to resources, goods or rights. There must be an action or omission on the part of the State, which may include distinction, exclusion, restriction or preference. However, any of these behaviours by public

⁹ Siqueira and Castro, “Minorias e grupos vulneráveis”, 111.

¹⁰ Judgment IACHR *Voto razonado del juez Eduardo Ferrer Mac-Gregor Poisot no Caso Trabajadores de La Hacienda Brasil Verde vs. Brasil*, 20 October 2026, *caso Hacienda Brasil Verde vs. Brasil*, 26.

¹¹ Maria Sofia Sagües, “Discriminación estructural, inclusión y litigio estratégico”, in *Inclusión, Ius commune y justiciabilidad de los DESCAs en la jurisprudencia interamericana el caso del campo y nuevos desafíos*, ed. Eduardo Ferrer Mac-Gregor, Mariela Morales Antoniazzi and Rogelio Flores Pantoja (Querétaro: Instituto de Estudios Constitucionales del Estado de Querétaro, 2018), 219.

¹² Eumar Evangelista de Menezes Júnior, Edson de Sousa Brito and Maria Helena Borges de Souza, “Direito das minorias e os múltiplos olhares jurídicos e sociais”, *Revista Cadernos de Ciências Sociais da UFRPE*, vol. 1, no. 4, (2014): 71, accessed July 17, 2023, <https://www.journals.ufrpe.br/index.php/cadernosdecienciasociais/article/view/564>.

¹³ Carbonell, “Constitucionalismo, minorias y derecho”, 107.

authorities is only legal and legitimate if there is adequate justification. In other words, the legitimacy of differential treatment must be established through an objective and reasonable examination of the measure introducing the distinction, taking into account the objective to be achieved. As stated by Nash Rojas and David,¹⁴ intention is not an essential requirement for discrimination.

In some contexts, traditional concepts of inequality and discrimination may prove to be inadequate. Structural discrimination, also known as systematic discrimination, is one of them. Structural discrimination is too complex to be tackled only by a neutral and rational analysis. It refers to the situation faced by groups that are systematically excluded from their rights by social, cultural and institutional practices rooted in popular behaviour.¹⁵

To face structural discrimination, Saba¹⁶ proposes adopting a structural vision of equality, which takes into account the situation of the person as an individual and as a component of a systematically excluded group. The principle of non-discrimination derived from an individualist idea of formal and legal equality is not enough to face the real inequalities that constitute society. This becomes evident when it comes to affirmative actions, which are differentiated treatments by the State in terms of recognising the need for special prerogatives for members of certain historically submissive groups. How can these beneficial treatments be justified solely under an individualist view of non-discrimination?¹⁷

The adoption of a structural equality concept has some important consequences. Firstly, affirmative action cannot be invalidated on grounds of formal equality. Secondly, in addition to the duty not to discriminate, States have an obligation to adopt compensatory measures to guarantee the exercise of rights by disadvantaged groups. Thirdly, it is impossible to adopt apparently neutral practices or policies that could negatively affect certain disadvantaged groups. This occurs because “a series of practices that appear neutral or that do not express a deliberate desire to discriminate can have the effect of discriminating against a defined group”, which would violate the right to equality.¹⁸

The doctrine of structural discrimination has been linked directly to some Court precedents, such as the IACHR. In the case of *Campo Algodonero v. Mexico*, for example, the Court referred to a culture of discrimination against women that contributed to the homicides that took place in the city of Juárez. In the case of *Xákmok Kásek v. Paraguay*, the Court analysed a state of nutritional, medical and sanitary vulnerability that continually threatened the survival and integrity of the community. In the case of *Atala Riffo y Niñas v. Chile*, it is possible to identify structural elements of discrimination around sexual minorities, returning to the reference of the *Campo Algodonero* case. In the case of *Expelled Dominicans and Haitians*

¹⁴ Cláudio Nash Rojas and Valeska David, “Igualdad y no discriminación en el sistema interamericano de derechos humanos” in *Derechos Humanos y Juicio Justo*, ed. Cláudio Nash Rojas and Ignacio Mujica (Lima: Grafica Columbus SRL, 2010), 173.

¹⁵ Nash Rojas and David, “Igualdad y no discriminación en el sistema interamericano de derechos humanos”, 173.

¹⁶ Saba, “(Des)igualdad estructural”, 126.

¹⁷ Saba, “(Des)igualdad estructural”, 134.

¹⁸ Víctor Abramovich, “Das violações em massa aos padrões estruturais: novos enfoques e clássicas tensões no Sistema Interamericano de Direitos Humanos”, trans. Akemi Kamimura, *Sur – Revista Internacional de Direitos Humanos*, v 6, no 11 (2009): 18-19, accessed July 17, 2023, <https://doi.org/10.1590/S1806-64452009000200002>.

v. Dominican Republic, there were several elements that exacerbated the situation, such as the fact that they were children and had no documentation. These precedents indicate that the doctrine of structural discrimination finds important antecedents in the jurisprudence of the IACHR. However, there are no definitive delimitations on the concept of structural discrimination in this same Court. Nonetheless, it is possible to find decisions based on cultural and historical elements.¹⁹

The opinion of Eduardo Ferrer Mac-Gregor in the case *Fazenda Brasil Verde vs. Brasil* provides some important technical elements that shape the edges of the doctrine of discrimination or structural inequality. He emphasises that structural discrimination requires the presence of a group of people, so that individual discrimination is excluded from the concept. This group must present at least three characteristics: (i) voluntary immutability of the characteristics that identify the members; and (ii) a connection to a historical factor of discrimination, regardless of whether this group forms a quantitative majority or minority in the social context. This also indicates that the recognition of structural discrimination is possible regardless of the existence of prolonged subordination.²⁰

The second aspect mentioned is the generalised situation of exclusion, marginalisation or submission that generates barriers to access to basic conditions for human development.²¹ This is the essence of the notion of structural discrimination, characterised as “a generalised situation of disadvantage, exclusion, subordination, marginalization or oppression”.²² While these elements are not exhaustive, they serve only as examples. What matters is the existence of systematic exclusion or marginalisation that prevents the full exercise of fundamental rights.²³ Despite the conceptual distinction presented at the beginning of this topic, the IACHR does not use the terminologies “vulnerable groups” and “minorities”, preferring to adopt the expression “groups in situation of vulnerability”. This terminological choice is justified by the Court’s objective of analysing each concrete case of a person or group at a specific moment, avoiding prior and/or stigmatising classifications.²⁴

In this context, it is possible to establish a very close relationship between structural discrimination and algorithmic discrimination. Hence, the objective of studying the latter is to understand how certain groups of people are automatically judged based on some of their characteristics. These judgments are influenced by beliefs about certain groups, resulting in prejudices that derive from stereotypes. In the virtual space, these beliefs often arise from cognitive errors and small sampling of experiences, which can be influenced by availability heuristic.²⁵ AI is not able to reflect or have a moral or philosophical understanding about its decisions and

¹⁹ Sagües, “Discriminación estructural, inclusión y litigio estratégico”, 132-137.

²⁰ Sagües, “Discriminación estructural, inclusión y litigio estratégico”, 137-138.

²¹ Judgment Corte IDH *Voto razonado del juez Eduardo Ferrer Mac-Gregor Poisot no Caso Trabajadores de La Hacienda Brasil Verde vs. Brasil*, 20 October 2026, caso *Hacienda Brasil Verde vs. Brasil*, 26.

²² Sagües, “Discriminación estructural, inclusión y litigio estratégico”, 138.

²³ Sagües, “Discriminación estructural, inclusión y litigio estratégico”, 139.

²⁴ Mônia Clarissa Hennig Leal and Sabrina Santos Lima, *A atuação da Corte Interamericana de Direitos Humanos na proteção de grupos em situação de vulnerabilidade: discriminação estrutural e sentenças estruturantes* (São Paulo: Tirant Lo Blanch, 2021), 73.

²⁵ Laura Schertel Mendes and Marcela Mattiuzzo, “Proteção de dados e inteligência artificial: perspectivas éticas e regulatórias. Discriminação algorítmica, conceito fundamento legal e tipologia”, *Revista Direito Público*, vol. 16, no 90 (2019): 47, accessed July 17, 2023, <https://www.portaldeperiodicos.idp.edu.br/direitopublico/article/view/3766/Schertel%20Mendes%3B%20Mattiuzzo%2C%202019>.

discoveries. It simply applies its method and produces a beneficial or harmful result, leaving humans to regulate and oversee the technology. As such, it is important that humans take responsibility for AI regulation and oversight.²⁶

Although AI tools allow algorithms to write parts of their own code, the initial programming is still done exclusively by humans, which is enough to transfer explicit, implicit or even disguised biases to the algorithm, making it biased until it is adjusted. In the context of structural discrimination, it is easy to identify how these biases are built into algorithmic codes, but it is difficult to demonstrate where they are not present. According to Tischbirek,²⁷ the doctrine of indirect discrimination is a good first step to combat algorithmic discrimination. It is important to demystify the idea that discriminatory intent is necessary, and to state that algorithmic discrimination is possible does not necessarily imply that programmers are malicious. Once the theoretical contributions on structural discrimination have been established, the next step is to address the notion of algorithmic discrimination.

3. Algorithmic discrimination and the reproduction of structural discrimination

In the 21st century, technological diffusion and digitalisation are two striking features that have changed several foundations of society and provided new business models in the so-called “*information society*” paradigm. Although the first meaning of the word “*algorithm*” had an eminently mathematical nature, currently, this same word refers to a sequence of logical and unambiguous instructions that can be executed by a computer, being divided into two subgroups: i) simple ones, which receive initial data and follow a predefined path, by the human programmer, to arrive at some determined result; and ii) those of AI, which, based on a differentiated heuristic approach, are given the responsibility of building a path between existing data and the intended result. In this case, the programmers provide the initial data as well as the expected result and expect the algorithm to solve some established complex problems.²⁸

AI algorithms are programmed to learn to solve specific problems that are still unsolved. The complexity of these problems often makes human programming oblivious, so sometimes programmers cannot even understand the paths established by AI, in a phenomenon called “*black box*” or “*algorithmic black box*”. Talking about the existence of algorithmic “*black boxes*” means to recognise the source code opacity, that is, problems of algorithmic transparency, which make it difficult, or even impossible, to understand what is written, even by the professionals qualified to do so.²⁹

²⁶ Henry A. Kissinger, Eric Schmidt and Daniel Huttenlocher, *A era da inteligência artificial: e o nosso futuro humano*, trans. José Mendonça da Cruz (Alfragide: Editora Dom Quixote, 2022), 83.

²⁷ Alexander Tischbirek, “Artificial intelligence and discrimination: discriminating against discriminatory systems”, in *Regulating artificial intelligence*, ed. Thomas Wischmeyer and Timo Rademacher (Cham: Springer, 2020), 113.

²⁸ Pedro Domingos, *A revolução do algoritmo mestre: como a aprendizagem automática está a mudar o mundo* (Lisboa: Editora Manuscrito, 2017), 25.

²⁹ Frank Pasquale. *The black box society: the secret algorithms that control money and information* (London: Cambridge, 2015), 8.

All algorithms work with inputs and output, that is to say: information is collected by the machine, which uses its algorithm to perform a specific task and delivers a result, which may be more or less accurate in relation to its original heuristic. Inserted in the genre “*AI algorithms*” there is also the existence of automatic learning techniques (“*machine learning*”) that allow the algorithm to learn from human skills and preferences.³⁰ Both Netflix’s movie and Spotify’s song suggestion algorithms can be cited as examples of “*machine learning*” algorithms that learn from human preferences. With regard to machine learning algorithms that seek to reproduce human skills, translation tools such as Google Translator and autonomous cars developed by Tesla can be cited as examples.

Thus, it can be inferred that the ability to decide autonomously is a fundamental assumption of algorithmic intelligence. How could an algorithm perform a human skill or recommend something without the ability to decide autonomously? In such a context, it must be considered that “*the perspectives of a free society, and even free will, may change. And even if this evolution proves to be benign or reversible, the different societies of our planet are obliged to understand these changes well*”.³¹ Understanding these changes also means understanding the risks. Algorithmic discrimination emerges as a problem inherent to the “*information society*”. As more aspects of analogue life migrate to the virtual world, such as personal and professional relationships, it becomes equally necessary to establish satisfactory relations between people and technology, especially considering that these technologies are developed by human beings who, intentionally or not, can transmit their biases to the algorithms they create.

Much of the advances experienced by digitisation and AI are due to the advance of “*big data*”, understood as the “*management of the technological infrastructure and its management of knowledge, specifically in the collection and the processing of information through the analysis of large accumulations of data or macrodata*”.³² Currently, “*big data*” is used to control individual and collective behaviour, as well as to register development trends and to generate new forms of production of goods and services. In addition to the beneficial uses of this technology, it is also possible to visualise its use for cybercrime.³³ Mere unpretentious Internet browsing implies the production of large amounts of data which, in turn, have the potential to generate value for public and private entities, as they allow controlling digital interactions through preferences in consumption and search tools, as well as the use of smart devices connected to the Internet capable of capturing images, sounds and texts in real time, with the aim of mapping individual preferences and behaviours.

In the path of analysing and expanding the possibilities of using digital data, especially through AI technologies, the so-called “*big data analytics*” emerges. This technology makes it possible to establish descriptive analyses with the purpose of prioritising, classifying, and filtering data. In addition, it enables predictive analysis, which identifies possible parameters of causal relationship in the form of

³⁰ Domingos, *A revolução do algoritmo mestre*, 32.

³¹ Kissinger, Schmidt and Huttenlocher, *A era da inteligência artificial*, 27.

³² Evelyn Téllez Carvajal, “Análisis documental sobre el tema del big data y su impacto em los derechos humanos”, *Revista de la Facultad de Derecho PUCP*, no. 84 (2020): 156, accessed July 17, 2023, <https://doi.org/10.18800/derechopucp.202001.006>.

³³ Wolfgang Hoffmann-Riem, *Teoria geral do direito digital: transformação digital* (Rio de Janeiro: Forense, 2022), 2-3.

correlations, translating them into probabilities that can indicate trends in human behaviour. Based on these trends, it becomes easier to apply automated decision techniques in interactions between algorithms and people.³⁴ However, this aspect can lead to algorithmic discrimination, especially when statistics produced on vulnerable groups are used.

Finally, the big data analytics technique enables prescriptive analysis, allowing an algorithm to recommend actions based on its prior descriptive and predictive knowledge. These algorithms can, for example, propose behaviours that will lead to certain results, such as forwarding news to a niche of indecisive people in order to influence their opinions about some topic. To achieve this goal, big data analytics proposes the expansion of knowledge generated from digital inferences and its use in different fields of application, which implies the use of immense amounts of data, far beyond personal data. It should be noted that the irresponsible use of these tools can violate not only the right to privacy, but also other rights, such as freedom of expression and equality.³⁵ Discrimination can be generated based on beliefs, religions, sexual orientation and other sensitive aspects, often collected without the knowledge of the individuals. At this point, it can be stated that the exclusive protection of personal data is insufficient to protect technological innovation, requiring a broader and more comprehensive approach in order to guarantee respect for fundamental rights.

Computers do not have prior knowledge about race, gender, religion or sexual orientation, which could lead to a misinterpretation that automated systems are capable of making less prejudiced decisions than human beings. However, what could lead an intelligent algorithm to become discriminatory? According to Tischbirek,³⁶ algorithmic discrimination can occur due to three different types of insufficiencies: i) insufficient data collection; ii) inadequate treatment of data; and iii) normative insensitivity. Both programmers and users of AI can use these shortcomings, consciously or unconsciously, to discriminate.

In the author's opinion, the most common form of algorithmic discrimination occurs when there is insufficient data information during the training phase of AI. This can result in biased data that distorts the results presented by the algorithm and can be caused by an over- or under-representation of certain groups. For example, if police more frequently patrol a neighbourhood inhabited by black people than neighbourhoods inhabited by white people, criminal statistics will show a bigger number of crimes committed by black people, not because of their characteristics, but because of the most frequent presence of police officers in the neighbourhood. If this data were inserted into an AI algorithm programmed for predictive analysis of crimes – use of big data analytics – the conclusion would be contaminated by overrepresentation bias, making neighbourhoods inhabited by black people more prone to criminal activities.³⁷

As result, an infinite discrimination feedback is established, as the algorithm creates a bias that makes a neighbourhood more dangerous due to greater police

³⁴ Wolfgang Hoffmann-Riem, "Artificial intelligence as a challenge for law and regulation", in *Regulating artificial intelligence*, ed. Thomas Wischmeyer and Timo Rademacher (Cham: Springer, 2020), 2.

³⁵ Carvajal, "Análisis documental sobre el tema del big data y su impacto em los derechos humanos", 159.

³⁶ Tischbirek, "Artificial intelligence and discrimination", 104.

³⁷ Tischbirek, "Artificial intelligence and discrimination", 105.

patrol, consequently directing police officers to patrol more and more this same neighbourhood, once again leading to further increasing crime rates:

“If police now gears its operations towards neighborhoods with the highest computed risk scores and plays data from these operations back into the system, this may result in a highly problematic feedback loop. The initial statistical distortions become bigger and bigger, for patrols are increasingly directed into certain parts of town, where they detect more crime, which will again push the neighborhood’s risk score.”³⁸

The second form of algorithmic discrimination stems from insufficient data treatment, where the data provided to the algorithm are sufficient and representative, but are mislabelled, inserting discriminatory biases in the process steps, such as automatic or manual data labelling.³⁹ In addition, biases can be inserted in the definition of the problem to be solved and in the way data are treated, revealing that algorithmic biases are not limited to data alone.⁴⁰

Finally, the third form of algorithmic discrimination is normative insensitivity. Predictive algorithms are based on statistics produced from data, conforming a look into the future based on past knowledge. Law, on the other hand, is produced counterfactually, that is, it depends on the occurrence of possible failures for its reformulation.⁴¹ Thus, the need for creating specific laws and regulatory measures to solve specific problems is evident, claiming for the establishment of appropriate standards to achieve the protection of fundamental constitutional principles, to protect free development and prevent the manipulation of data for discriminatory purposes.⁴²

In Brazilian legal doctrine, Mendes and Mattiuzo⁴³ identify four types of algorithmic discrimination: (i) discrimination by statistical error; (ii) discrimination by generalisation; (iii) discrimination for the use of sensitive information; and (iv) discrimination limiting the exercise of rights. The first one refers to any type of statistical error that may occur in data collection or in the algorithm code, resulting in a failure to account for all available data.⁴⁴ The engineer or data scientist designing the algorithm is usually responsible for this form of discrimination.

The second, i.e., discrimination by generalisation, occurs when the model is working perfectly, but some people are misclassified into certain groups. For example, if a person lives in a neighbourhood commonly associated with poverty and the model has no information beyond their address to decide whether or not they are a good candidate for a loan, it will classify them as belonging to a group to which they may not belong to. This could occur if that person has a higher or lower income than people in the neighbourhood, for example. Thus, although the algorithm is correct, as well as information, the result will still be an incorrect generalisation.⁴⁵

³⁸ Tischbirek, “Artificial intelligence and discrimination”, 105.

³⁹ Tischbirek, “Artificial intelligence and discrimination”, 106.

⁴⁰ Karen Hao, “Cómo se produce el sesgo algorítmico y por qué es tan difícil detenerlo”, trans. Ana Milutinovic, February 8, 2019, accessed July 17, 2023, <https://www.technologyreview.es/s/10924/como-se-produce-el-sesgo-algoritmico-y-por-que-es-tan-dificil-detenerlo>.

⁴¹ Tischbirek, “Artificial intelligence and discrimination”, 107.

⁴² Hoffmann-Riem, “Artificial intelligence as a challenge for law and regulation”, 2.

⁴³ Mendes and Mattiuzo, “Proteção de dados e inteligência artificial”, 51-52.

⁴⁴ Mendes and Mattiuzo, “Proteção de dados e inteligência artificial”, 51-52.

⁴⁵ Mendes and Mattiuzo, “Proteção de dados e inteligência artificial”, 52.

Discrimination using sensitive information occurs when decisions are based on data protected by law, such as ethnicity or religion, to define a person's credit score, for example. Discrimination limiting rights, on the other hand, differs from that which uses sensitive information, since it is not just about its use, but about the connection between the information used by the algorithm and the exercise of a right. If a right is seriously affected by the information that is used, discrimination is likely to occur. This type of discrimination is even more perverse, as it reinforces discriminatory treatments that already exist, making it even more difficult for members of historically discriminated groups to overcome a situation of disadvantage.⁴⁶

Although the terms are different, the four types of discrimination mentioned by Mendes and Mattiuzo are close to the ones presented by Tischbirek. This is so because a statistical error is an insufficiency in data processing; a generalisation error, where a person is mislabelled, is a failure in data collection; and the use of sensitive information constitute normative insensitivities that need to be regulated by law, according to the risks and vulnerabilities involved.

After overcoming the terminological distinctions, it can be said that there will be algorithmic discrimination when an excluding systematic failure is identified and analysed in light of anti-discrimination legislation, and it fits the concepts provided therein. Therefore, it is essential to analyse the source code.⁴⁷ Although there is no anti-discrimination legislation compiled in Brazil, the fundamental objectives of the Federal Constitution towards eradicating poverty, marginalisation and reducing social and regional inequalities, as well as promoting the good of all people without prejudice of any kind, indicate that algorithms that violate these objectives and the principle of equality before the law, provided for in Article 5 of CRFB/88, can be considered discriminatory.

Therefore, it can be stated that algorithmic discrimination is a complex and multi-causal phenomenon that is more common in algorithms programmed through AI and machine learning techniques that exclude the access of certain people, or groups of people, to goods, services and rights. It remains for the legal sciences to regulate this algorithmic technological development, above all in a preventive way, based on the establishment of minimum standards on human rights protection. In this context, strongly characterised by structural discrimination, it is also important to analyse the role of structural injunctions in combating structural problems, conceived as a relevant tool to overcome and prevent algorithmic discrimination.

4. Structural injunctions: some considerations about its relevance as a tool to prevent algorithmic discrimination

Faced with limited human imaginative capacity, as well as the inability of the traditional legislative process to keep up with the incessant technological innovations, it is necessary to think about alternatives to be taken into account in regulating the matter. In such a scenario, structural injunctions emerge as a potential tool in terms of facing structural discrimination that lead to algorithmic discrimination. The concept of structural process involves a combination of some characteristics. The

⁴⁶ Mendes and Mattiuzo, "Proteção de dados e inteligência artificial", 52-54.

⁴⁷ Jon Kleinberg et al, "Discrimination in the age of algorithms", *Journal of Legal Analysis*, vol. 10 (2018): 114, accessed July 17, 2023, <https://doi.org/10.1093/jla/laz001>.

first one corresponds to the existence of a complex conflict involving multiple poles of interest that appear in opposition and partial alliances. The idea of bipolarity, typical of common disputes, is insufficient in the context of structural disputes.⁴⁸ The second, in turn, corresponds to the need of implementation, through courts, of legally important public values, or constitutional purposes, not yet spontaneously implemented in society. Some procedurally intended objectives require a break with the traditional right-obligation-violation-reparation structure, so that compensation or penalty, although essential from the victim's perspective, are often ineffective with regard to carrying out the public interest to prevent similar violations of rights. The third characteristic corresponds to the need of reform of institutions, public or private, in prestige to the public value to be implemented. This institution can be a protagonist in the violation of the right under discussion, or it can only represent an obstacle to its realisation.⁴⁹

An important point to bear in mind is not to mistake the need for the existence of multiple poles of interest with the presence of multiple procedural actors. The configuration of a structural dispute does not depend on the presence of multiple procedural actors. Indispensable is the overlapping of particular interests in a complex but unique mosaic. In other words: it is possible to have a structural process with a single actor, representing a complex mosaic of interests.⁵⁰ Therefore, one can conceptualise structural disputes as those that involve multipolar conflicts of high complexity, whose objective is to promote public values through judicial review, regarding the transformation of a public or private institution. There is a need to reorganise an entire institution, changing its internal processes, its bureaucratic structure, and the mentality of its agents, so that it starts to fulfil its function in accordance with the value stated by the decision.⁵¹

Puga⁵² brings important procedural dogmatic considerations to the topic. According to the Argentine author, structural disputes are not joinder disputes, understood as those in which more than one actor appears in one of the poles of the claim. Incidentally, disputes discussed in joinders are in no way related to the intention of a court to extend the understanding of what can be judged, which can be appreciated by the Judiciary. Furthermore, in joinder of parties, the dispute of each of the partners, even if assessed in the same process, may be different, in terms of the extent of the damage, for example. Structural disputes are more related to collective processes, which may have only one plaintiff representing a multiplicity of interests which, from a judicial perspective, are unique and indivisible. However, nothing prevents a structural dispute from also arising from an individual dispute.

In other words, structural disputes can happen both in individual lawsuits and in collective lawsuits, but they are more common in those considered polyhedral. The physiognomy of a polyhedral case can be best visualised in the image of a spider's web formed by multiple threads, all interconnected, where the tensions exerted on

⁴⁸ Mariela Puga, "El litigio estructural", *Revista de Teoría del Derecho de la Universidad de Palermo*, no. 2 (2014): 45, accessed July 17, 2023, https://www.palermo.edu/derecho/pdf/teoria-del-derecho/n2/TeoriaDerecho_Ano1_N2_03.pdf.

⁴⁹ Edilson Vitorelli, "Litígios estruturais: decisão e implementação de mudanças socialmente relevantes pela via processual", in *Processos estruturais*, ed. Sérgio Cruz Arenhart, Marco Félix Jobim and Gustavo Osna (Salvador: Editora JusPodivm, 2022), 351-352.

⁵⁰ Puga, "El litigio estructural", 47.

⁵¹ Vitorelli, "Litígios estruturais", 353-354.

⁵² Puga, "El litigio estructural", 47-48.

any of the threads spill over into the others. In the spider's web structure, the claim of each party to the conflict connects with the others through multiple intersections of influence. In this metaphor, the judicial decision represents a tension exercised with repercussions throughout the network, which is why the sentence rendered in a structural dispute must also consider the impacts suffered by those who are not present in the process.⁵³

The concept of structural processes arises from the search for implementation, by American federal judges, of the decision handed down by the United States Supreme Court in the case of *Brown v. Board of Education*.⁵⁴ In this judgment dated May 17, 1954, the Court held that racial segregation in public elementary and secondary schools violated the principle of equality before the law enshrined in the 14th Amendment of the American Constitution. On that occasion, the sentence invalidated all the laws which, up until that moment, allowed the existence of separate public schools for white and black children and adolescents. With the abolition of slavery, undertaken in the mid-nineteenth century, people with black skin colour were recognised as holders of civil rights, such as property, freedom to contract and to exercise their basic political rights, such as voting and being elected.⁵⁵

However, in 1877, the situation of African American citizens worsened, especially in the southern states, where it was possible to visualise a growth of social practices with the aim of restricting the rights conquered until then. These discriminatory practices were supported by several local and state laws that became known as Jim Crow Laws, which, cunningly, maintained the constitutional rights held by black citizens, but separately and in different places from white citizens. Additionally, there was a considerably increase in private violence undertaken against African Americans, followed by impunity for white perpetrators. Since the First World War, the Jim Crow Laws faced strong resistance. It was only after the Second World War that changes in racial matters could be observed. The post-war anti-fascist ideology raised the importance of African American demands, therefore increasing their opportunities.⁵⁶ At the end of the 1960s, judges and lawyers began to use the understandings and foundations developed in cases of school racial segregation in other areas, such as health, security and the prison system. The result was the use of injunctions elaborated in school cases to reform American hospitals, police departments and correctional facilities.⁵⁷

The main criticisms faced by structural processes, in the past and currently, reside in the theory of separation of powers, since, in theory, they attribute executive and even legislative powers to judges. This is because the magistrates of a structural process, faced with an institutional behaviour that violates the legal system, as well as human and fundamental rights, must formally establish this finding and, using a predefined methodology, seek mechanisms to achieve the desired result.⁵⁸ At this

⁵³ Puga, "El litigio estructural", 48-56.

⁵⁴ Owen M. Fiss, "Fazendo da Constituição uma verdade viva: quatro conferências sobre a structural injunction", trans. Arthur Ferreira Neto, Hannah Alff and Marco Félix Jobim, in *Processos Estruturais*, ed. Sérgio Cruz Arenhart, Marco Félix Jobim, Gustavo Osna (Salvador: Editora Juspodivm, 2022), 1061.

⁵⁵ Mariela Puga, "La litis estructural em el caso *Brown v. Board of Education*" in *Processos Estruturais*, ed. Sérgio Cruz Arenhart, Marco Félix Jobim, Gustavo Osna (Salvador: Editora Juspodivm, 2022), 90.

⁵⁶ Puga, "La litis estructural em el caso *Brown v. Board of Education*", 91.

⁵⁷ Fiss, "Fazendo da Constituição uma verdade viva", 1061.

⁵⁸ Vitorelli, "Litígios estruturais", 358.

point, Fiss⁵⁹ argues that such criticisms depart from a myopic view of what underlies democracy, restricting it to the notion of majoritarianism. In the author's opinion, "democracy is a standard applied to judge the system of government taken as a whole"⁶⁰ which implies that different institutions have different functions, some more in tune with popular sentiment, such as the Executive and Legislative Branches. However, the Judiciary is directly linked to these institutions, since it has the task of giving the most correct interpretation to the constitutional text. The phenomenon of the material constitutionalising of law binds the three State Powers, which become linked to established constitutional principles:⁶¹

Those who oppose structural reform may argue that it allows the judiciary to usurp functions that rightly belong to the executive and legislative branches and thus violates the venerated principle of the separation of powers. This objection neglects the multidimensional nature of the judge's authority and, indeed, his duty – the judge must not only decide the author's rights, but also make this right a practical reality.⁶²

In other words, the Judiciary must ensure the Constitution. In this context, the structural processes enable a performative judicial function, where the judge is required to hold normative decisions, making it possible to expand the terrain of what can be judicialised in order to reach practices hitherto unrelated to the judicial debate. Sometimes, this implies that the Courts may not directly grant the request as a condition of individual subjective rights, preferring to point out certain paths and measures to be followed or implemented by State and other actors,⁶³ including civil society.

The current jurisdictional protection aimed at human and fundamental rights has considerably altered contemporary democracies. The protection of those rights sometimes goes beyond the mere reparation of experienced violations. Parting from an increase in importance of human and fundamental rights, especially after their provision in international human rights treaties and in constitutional texts, combined with their radiant effectiveness and their nature closer to principle than rule, judges seek to implement the content of those rights in concrete cases.⁶⁴ Human and fundamental rights bring with them the idea that the Constitution goes beyond the criteria of the majority, and the rights of any minorities that find themselves in this space must be protected, whether due to lack of representation, or due to some other factual-temporal circumstance. "The Constitution appears, precisely, as an element of stability in the midst of the game of oscillation of majorities".⁶⁵

In this context, through structural injunctions, the Judiciary tries to guarantee effectiveness to constitutional statements in the face of serious violations of human and fundamental rights. From the recognition of the existence of structural causes

⁵⁹ Fiss, "Fazendo da Constituição uma verdade viva", 1062.

⁶⁰ Fiss, "Fazendo da Constituição uma verdade viva", 1062.

⁶¹ Mônia Clarissa Hennig Leal, *Jurisdição constitucional aberta: reflexões sobre a legitimidade e os limites da jurisdição constitucional na ordem democrática – uma abordagem a partir das teorias constitucionais alemã e norte-americana* (Rio de Janeiro: Lumen Juris, 2007), 73.

⁶² Fiss, "Fazendo da Constituição uma verdade viva", 1073.

⁶³ Vitorelli, "Litígios estruturais", 360.

⁶⁴ Néstor Osuna, "Las sentencias estructurales. Tres ejemplos de Colombia", in *Justicia constitucional y derechos fundamentales. La protección de los derechos sociales. Las sentencias estructurales*, ed. Victor Bazan (Bogotá: Fundação Konrad Adenauer, 2015), 91.

⁶⁵ Leal, *Jurisdição constitucional aberta*, 52.

that, in a systemic way, produce deficits in human and fundamental rights, added to the knowledge that an individual remedy will not be enough to solve the problem, the Judiciary chooses to structure more robust solutions. The origin of the term “*structural sentences*” is found in the “*structural injunctions*” of United States jurisprudence which, since the mid-21st century, has been committed to adopting structural measures to repair serious and generalised situations that resulted in violation of the Constitution, so that the structural remedies aim to reform an institution of the State to harmonise it with the Constitution.

What defines structural injunctions is that the judge is empowered, as the highest interpreter and defender of the rights established in the Constitution, to define how authorities should act to guarantee the effective exercise of those rights, pointing out matters that have been seriously neglected by them. Consequently, these kinds of orders exceed the inter *partes* aspects of the case that originated the sentence, aiming to solve a widespread and complex problem that has been detected.⁶⁶

Structuring decisions presuppose respect and willingness to comply with imposed measures. Without that, they tend to lose effectiveness, relevance and legitimacy, becoming mere appeals to other State actors. Structural processes cannot replace individual litigation; what should exist is a relationship of complementation and reinforcement, especially in situations of prolonged legislative or administrative omission: “*structuring decisions serve to ensure a unitary and more systemic solution, but precisely because of the resistance to its fulfilment, they cannot rule out specific demands.*”⁶⁷

The mechanisms to monitor the effective fulfilment of the orders contained in the structuring sentences consist in the creation of monitoring rooms and records. The follow-up rooms should be representative of civil society agents, experts in areas related to the identified structural problem, and people interested in the situation and government members. The follow-up records, in turn, are decisions handed down by the courts, based on information from the rooms, which seek to enable or encourage some particularity identified in the process of compliance with the sentence. In the structural sentences, the Constitutional Court must be open to the principles of the social and democratic State of Law, which highlights the existence of certain situations that, due to lack of interest in the political agenda, are not properly addressed and regulated by the other public powers, especially those related to human and fundamental rights.⁶⁸

Here, structural processes and, consequently, structuring sentences become intertwined with the theme of algorithmic discrimination as a structural and systemic problem awaiting a complex solution. It is necessary to visualise the overlapping interests of States, users of technologies and companies that develop them in order to robustly regulate technological development in order to prevent algorithmic discrimination of vulnerable groups and minorities, in the perspective of structural discrimination.

⁶⁶ Osuna, “Las sentencias estructurales” 92.

⁶⁷ Ingo Wolfgang Sarlet, “Direitos fundamentais sociais e mínimo existencial – notas sobre um possível papel das assim chamadas decisões estruturantes na perspectiva da jurisdição constitucional”, in *Processos Estruturais*, ed. Sérgio Cruz Arenhart, Marco Félix Jobim, Gustavo Osna (Salvador: Editora Juspodivm, 2022), 642.

⁶⁸ Osuna, “Las sentencias estructurales, 113.

Conclusion

By contextualising algorithmic discrimination, it is possible to identify that it is a multicausal phenomenon associated, above all, with AI algorithms, whose objective is to provide autonomous conclusions that can reproduce historically structural discriminations. According to what has been argued, there are at least three causes that contribute to algorithmic discrimination: (i) insufficient data; (ii) insufficient handling of data; and (iii) normative insensitivity. The latter is considered the most significant of them since the State has the responsibility to protect the human and fundamental rights of people against injuries or threats.

However, the human ability to foresee situations is limited, as well as the capacity of the State, as a legislative power, to keep up with the speed of technological innovations. In this context, initial considerations were presented on the theme of structural processes, which can be defined as a way of judicially discussing complex and multipolar situations, seeking to transform this reality through structured measures, in a dialogic perspective.

Given the complexity of algorithmic discrimination and the need to regulate this field of technological development to avoid harming human and fundamental rights, the proposed research hypothesis was confirmed. The conclusion is that structural injunctions adopted by courts seeking to attack the roots of discrimination, especially those related to vulnerable groups, are an important tool to prevent algorithmic discrimination, just as the standards related to the protection of these groups established by the IACHR should be taken as parameters for legislation and regulation of the use of AI.