# The Great Equalizer or a Modern Iteration of Historical Inequality: Artificial Intelligence in Latin America


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**Abstract**

In recent years, governments across Latin America have taken steps to foster the development and implementation of artificial intelligence causing an expansion of the use of AI in the region. For instance, countries like Colombia and Argentina are using AI in their judicial systems. Superficially, the allure of AI in the judicial system stems from the thought that AI is an impartial entity that will pass fair and unbiased judgement. However, just like the programmers responsible for creating AI, algorithms used in AI system can be biased. The reason being AI is often trained to make predictions or decisions based on training data. This data is often a reflection of the all aspects of a society including its prejudices and biases. Thus, AI has the potential to perpetuate the prejudice and bias found in the judicial system if left unchecked. This paper explores inequality and AI regulation in Colombia, Argentina, and the United States in order to determine if AI in Latin America can help reduce inequality in the region. I find that lack of regulation surrounding AI and a pattern of inaction with regard to inequality and bias indicates that AI will not be able to lessen inequality in the region.

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## Chapter 1: Introduction

### A Boring Dystopia:

"The world as it was at the end of the twentieth century. It exists now only as part of a neural-interactive simulation that we call the Matrix…We have only bits and pieces of information but what we know for certain is that at some point in the early twenty-first century all of mankind was united in celebration. We marveled at our own magnificence as we gave birth to AI...A singular consciousness that spawned an entire race of machines. We don't know who struck first, us or them." These are the words of Morpheus in the cult classic, The Matrix. In this scene, he explains to the movie's protagonist, Thomas Anderson aka Neo, that humans lost the war against intelligent machines and are now living in a simulated reality created by these machines. The Matrix is just one example in a long history of literary and cinematic works that center around the potential negative effects of technological advancements. Technology such as artificial intelligence has long been used as the backdrop for fictional dystopian futures. Whether it be The Matrix where AI systems are harvesting the bioelectric power of humans or Terminator where the Skynet, a conscious AI system, causes a nuclear war, many people have been exposed to ruminations about artificial intelligence's ability to bring about the destruction of society as we know it.

These depictions, however, are made for entertainment purposes and are greatly sensationalized. Imagery such as killer robots have become the standard for intelligent technology gone awry. Consequently, people expect missteps in the construction of technologies to be glaringly apparent. They believe that they would be able to see it coming or at least be aware of it when it happens. It is also something that is relegated to the future. However, the dangers of intelligent technology like AI in the real world are much more mundane and boring. Take for example the components of a killer robot. Obviously, there is the mechanical aspect of a robot with the ability to move. More importantly there needs to be

a way for the robot to determine its target. Usually this is based on physical appearance or through some conclusion that is reached after analyzing data about a person. This can be made possible through the utilization of different fields of AI such as computer vision and machine learning. Computer vision is a subfield of artificial intelligence that trains computers to interpret and understand the world through visual means (Sebe et al. 2014, 1). Machine learning is a type of AI that allows systems to learn from data, make decisions, and improve their own performance over time (Marr 2019, 4). Thus, on the most basic level, all of the components to make the archetypal killer robot are already in existence but are just being used in a very different manner. Thus, the reality of killer AI is not a robot brandishing some sort of weapon and hunting humans but instead a system that reduces people to a collection of data points and decides whether they are deserving of parole, housing, and specialized healthcare amongst other things. However, AI systems are not inherently dangerous. Rather, they simply have the potential to cause societal harm through the continuation and normalization of discriminatory practices.

This thesis explores how historical and contemporary racial inequality and AI regulation or the lack thereof within Latin America affects the likelihood of AI systems in the region being biased. I seek to answer the following question: Is AI, given the possibility of algorithmic bias, a tool that can help reduce inequality in Latin America within the judicial system, and if so under what circumstances? I address this research question by using a comparative study of Colombia, Argentina, and the United States. I begin by outlining the regional significance and theoretical framework of my thesis. In doing so, I aim to exhibit how historical means of knowledge production within Latin America have been biased and how overlooking or underestimating the effect of these biases can lead to biased AI systems.

In the second chapter, I contextualize race and its construction in Latin America and the US in order to provide the historical foundation upon which contemporary racial

inequality is built. For most of the United States' history, the racial hierarchy in the country was very apparent and was even enforced through legislation. However, the construction of race and national identity within Latin America especially after the wars of independence upheld colonial racial hierarchies in practice while simultaneously denying them discursively. It did so by using progress and modernity as a tool to conceal and dismiss claims of prejudice. This shows a concerning pattern of inaction and disregard that may extend to AI systems and how bias within them is handled. Chapter three provides background information about AI including the history of AI, AI within the Latin American context, bias in AI, and methods of mitigating bias. This information allows me to better identify ways that societal biases in Latin America can affect the data used in AI systems as well as how current regulation may be lacking.

In chapters four, five, and six, I provide empirical analysis of historical and contemporary inequalities, the lack of disaggregated data, and the state of regulation, respectively. In chapter four, I establish a precedent for how bias and inequality are managed at the national level. In chapter five, the precedent is strengthened through an analysis of how data has historically been used to further national narratives of identity which often exclude marginalized groups. Finally, chapter six explores the ways in which legislation and regulations for AI related topics in Latin America go against or adhere to the precedent established in the prior chapters. I also include a similar analysis of the United States' regulations in order to provide a real-world example of how lack of regulation can lead to biased AI systems that negatively affect vulnerable groups. I then provide a newspaper analysis of La Nacion and El Tiempo to analyze how AI is portrayed in the media and thus how the general public views AI. Throughout these chapters, I extrapolate the established precedent to predict how potential algorithmic bias will be handled and whether it will help to reduce inequality. I argue that due to the unresolved issues of inequality present in most Latin

American countries, the AI systems being used in the judicial system will perpetuate and amplify pre-existing inequalities.

**Regional Significance:**

Historically, Latin America development projects and operations have included an emphasis on "technological and productive catch-up" (Suarez and Yoguel 2020, 661). Therefore, it is not surprising that Latin American countries have started funneling resources into their burgeoning technology scene. Specifically, a new focus has been placed on artificial intelligence and how it can benefit Latin American countries. A 2017 economic study published by the Fortune 500 Global consulting and processing company Accenture predicted that AI in South America could boost the annual economic growth of the region by a percentage point by 2035 (Ovanessoff and Plastino 2017, 3). However, AI integration extends beyond the private sector and into public sectors of society such as the judicial system. This is not surprising considering that AI has the potential to streamline many bureaucratic processes by quickly gathering relevant data and filing paper work with minimal clerical or typographical errors. Thus, the workload of employees and wait time for citizens are reduced. Two of the main AI systems that are being implemented in Latin America are Prometea in Argentina and PretorIA in Colombia. These systems are being presented as a solution to the issues of backlogs and slow turnarounds in the judicial system. It should be noted that currently these systems are being used in relatively simple cases, and complex cases are still being primarily handled by actual lawyers and judges. However, based on the increased focus on AI implementation in the region, the systems are likely to be developed further and used in a wider variety of cases. Thus, it is important to preemptively analyze the risks of such systems before they reach the point of being utilized for high stakes cases.

There are many challenges related to ethics and bias that must be overcome when creating AI systems. Therefore, if the developers are not conscious of the possible biases being programmed into the systems that they are creating, the marginalization of specific groups within the country of use can be further perpetuated. This is a very relevant concern especially in a region like Latin America that is so racially and ethnically diverse with a history of colonialism that still affects contemporary society. And the level of inequality within the region is already relatively high. According to the World Bank, Latin American and Caribbean countries have Gini coefficients ranging from .38 to .57 (World Bank 2018).

Juan Gustavo Corvalán the director of the Laboratory of Innovation and Artificial Intelligence at the University of Buenos Aires who was involved in the development of both of the AI systems analyzed in this paper is confident this will not be the case. He stated, "Prometea not only makes justice more egalitarian, but it makes it much more efficient and fair" (Berchi 2019). He has also stated that ultimately "Prometea's predictions are based on the analysis of the history of what the judges have decided, it is they who train the system" (Berchi 2020). Consequently, the AI system simply reproduces the behavior of the country's judiciary system. These two statements are not necessarily at odds with one another in terms of efficiency because as stated before AI systems can streamline processes very easily. I also agree that they can make justice more egalitarian in that they allow more people to make use of the court systems and receive decisions in a timelier manner. However, in regards to making the actual results and content of the justice system's decisions fair, the two statements do have some points of contention. If the justice system was not "fair and egalitarian" prior to the implementation of the system, it will not be after the system is implemented either. Consequently, it is not likely that the AI systems such as Prometea and PretorIA will be able to make the region more equal because bias and discrimination were present in the court systems of Latin America prior to the creation of these systems.

**Theoretical Framework:**

I will be using Latin American decolonial theory as the basis for my research. Decolonial theory as developed in Latin America posits that modernity and coloniality are two closely linked phenomena that coproduce one another. Coloniality of power is a concept first presented by Aníbal Quijano in his seminal work Colonialidad, Poder, Cultura y Conocimiento en América Latina (Coloniality, Power, Culture, and Knowledge in Latin America). Quijano considers coloniality of power to be the successor of colonialism.

Under colonialism, there was an explicit system of epistemological, political, cultural, and social domination (Quijano 2007, 168). One of the most efficient and enduring methods of domination was racialization and subsequently racial hierarchization (Quijano Questioning Race 45). In addition to domination on the basis of race, there was also a systematic repression of the "beliefs, ideas, images, symbols [and] knowledge" associated with these dominated groups of people (Quijano 2007, 169). The process of repressing these aspects of life began with separating colonized people from their identities. This process was aided in part by the rapid demographic changes indigenous people underwent as a result of disease, massacres carried out by conquistadors, and dangerous work conditions that lead to societal and cultural collapse for some groups (Quijano 2007, 169). In the case of Africans, they were physically and geographically removed from their original means of cultural production (Quijano 2007, 169). After these dominated groups were stripped of their identities, they were then given new identities that were defined by Europeans (Quijano 1999, 139). Groups that were once known as Aztec, Maya, Inca, etc. were now simply "indios". Similarly, those who identified themselves as Yoruba, Ashanti, Fula, etc. were categorized as "negros". Furthermore, colonized people had no access to means of education outside those provided by dominant groups which they were often barred from. Consequently, through historical alienation, indigenous people and people of African descent were reduced to illiterate and

impoverished groups despite their ancestors belonging to developed and sophisticated societies (Quijano 1999, 139). After the countries began gaining their independence, colonialism vanished but the system that followed both reflected and reproduced its colonial predecessor. Coloniality of power is this implicit system of privilege and disadvantage on the basis of race, ethnicity, and nationality.

The history of dominant groups in Latin America hoarding all modes of education and knowledge is central to the creation of modernity in its current form. Quijano describes three separate phrases of marginalized groups' connection to knowledge after becoming colonized peoples. First, they were excluded from means of acquiring knowledge. Then, certain individuals were given access to this knowledge in order to expand the scope of the dominant group and maintain power structures. Finally, the Eurocentric model of knowledge and its production was transformed into an aspirational pathway to power (Quijano 2007, 169). Many marginalized groups within Latin America internalized this rigid model of knowledge after generations of being subjected to the hegemonic knowledge systems imposed by European colonizers. As a result of Europe's monopoly on knowledge, the concepts of progress and modernization also became entangled in Eurocentricity. Therefore, Enrique Dussel defines modernity as "a European phenomenon but one constituted in a dialectical relation with a non-European alterity that is its ultimate content" (Mignolo 2007, 453). According to this definition, in order for Europe to act as the paradigm of modernity non-Europeans must act as the antithesis of modernity. This can be seen in the historical dichotomy between indigenous or African people and Europeans. Where one group was characterized as civilized or advanced the other was seen as barbaric or primitive. Thus, modernity under decolonial theory is a Eurocentric center – periphery system.

Harding succinctly states that decolonial theory is important because "the local characteristics—on both sides of the Atlantic—of the Spanish and Portuguese colonization of

the Americas...played a significant role in the formation of modern social orders and, consequently, of the coproduction of their sciences and technologies" (2016, 1066). According to this theory, the history of the Eurocentricity of knowledge in Latin America can factor into the way in which AI systems are developed and what models are prioritized, regardless of whether the systems are imported or created within the country. This can be seen in the way AI is often described in terms of progress and modernity. Thus, it is important to consider this framework and be critical about the way in which AI and the rhetoric surrounding it can affect society.

## Chapter 2: History of Race and Ethnicity in Latin America & US

Across the globe, hierarchies are often predicated on the notion of race and ethnicity. Therefore, when looking at what groups would be disadvantaged in the face of algorithmic bias in Latin America, it is important to acknowledge how race and ethnicity in the region contribute to inequality. Latin America is often portrayed as being a monolithic region that is composed of mestizos. However, the opposite is actually true. Latin America is a very expansive and diverse region. In fact, the region varies so greatly that one of the only unifying elements is a shared history of Spanish colonization and subsequent Spanish language acquisition. Due to the many racial, ethnic, historical, and geographical idiosyncrasies of each country, it is impossible to make sweeping generalizations when talking about the region. Hence, in my following historical analysis I will be describing the ways in which the basic societal structures put in place by colonial Spain have historically allowed discrimination and prejudice on the basis of race and ethnicity to permeate Latin America. I will do this analysis without regard to the way in which specific countries divergently evolved within foundational colonial structures in order to make a more cohesive argument.

Although the history of Latin America does not start with the Spanish Conquest, it is through the colonization of the Americas that the socially constructed concept of race as we know it today came to exist (Reid-Merritt 3). With this history of colonization, like many other regions around the world, a racial hierarchy was established in Latin America with people of European descent holding the most power. While legally this system no longer exists, the vestiges of the caste system established during colonization still remain a very real part of daily life for people who are of indigenous or African descent (Dijk 2009, 10-11). However, following the conquest, extensive interracial relationships developed causing many Latin Americans to not be able to fit into rigid monoracial categories. Consequently, the

social hierarchy adapted and expanded to maintain the power structure the conquistadors established. For this reason, Peter Wade considers mestizaje or racial mixing within Latin America to be a biopolitical and biocultural process (2017, 1). According to Alejandro Lipschutz, the contemporary manifestation of these remnants of the colonial era hierarchies can be described as a pigmentocracy (Telles 2014, 3). Pigmentocracy is used to refer to "inequalities or hierarchies based both on ethno-racial categories, such as indigenous and black, and a skin color continuum" (Telles 2014, 4). The implication of this type of social structure within Latin American countries is that with proximity to whiteness racially or phenotypically comes certain privileges. As a result, the nature of how one's relationship to whiteness is created and sustained within Latin America differs from in the United States.

The United States is the site of arguably the most infamous instances of chattel slavery in the world. Euphemistically referred to as the "peculiar institution", the enslavement of African individuals en masse in the Americas would lead to the modern conceptualization of race. Although race can have very tangible effects on people's lives, it is pseudoscientific and socially constructed concept that was created to justify the heinous treatment of enslaved and indigenous people (Reid-Merritt 2017, 5). As a tool of subjugation and hegemony, the construction of race was almost inextricably linked to not only white superiority but also black and indigenous inferiority (Reid-Merritt 2017, 7). With the operationalization of racial categories came the ability for the United States to legislate interactions between racial groups.

Historically, the United States has had a relatively static perception of race that does not change between birth and death, especially in the case of people of African descent. This is most commonly shown through what is known as the "one drop rule" which was a form of hypodescent. Hypodescent refers to the "automatic assignment by the dominant culture of children of a mixed union...to the subordinate group" (Hickman 1997, 1163; Kottak 2009,

238). In the late 19th century, this notion of race was upheld by the United States' Supreme court case Plessy v. Ferguson. In this case, it was ruled that although Homer Plessy was 7/8s white as well as phenotypically white he was still considered black legally (Hickman 1997, 1163). With this precedent of racial categorization, it becomes very evident that one of the most important metrics by which race was determined in the United States was ancestry as opposed to phenotypic presentation.

Legislation limiting interactions between races also expanded beyond public areas such as in the case of Plessy vs Ferguson into more private areas of life such as marriage and other romantic relationships. As stated before, the "one drop rule" is perhaps the most famous iteration of the incorporation of racial identity in the jurisprudence of the United States. However, the rule was just one result of two hundred years of various state legislation that attempted to draw a "color line" and would not become the legal standard until the 20th century (Reid-Merritt 2017, 100). As early as the 1600s, there were cases of punishment for interracial relationships such as in the case of Hugh Davis who was publicly whipped for "defiling his body and lying with a Negro" (Reid-Merritt 2017, 100). Additionally, more formally in 1691, the state of Virginia enacted a law banning "free Negroes and free whites from marrying" (Reid-Merritt 2017, 100). It would not be until 1967 that on a federal level "anti-miscegenation" laws would be declared unconstitutional as a result of the supreme court case Loving vs Virginia.

The concept of race within Latin America, however, is more nebulous. The ability for race to be malleable and changing within Latin America is exhibited through a phenomenon known as blanqueamiento or whitening. In many cases throughout Latin America, the process of blanqueamiento had close ties with eugenic ideologies that can be seen in the use of common phrases such as "mejorar la raza" which translates to "better the race" (Casale-Hardin 2017). The phrase exhibits how whiteness is not only connected to an idealized

phenotypic presentation but also a set of social and behavioral norms. These norms often act as an antithesis to the cultural norms associated with indigenous people and afro-descendants. The sentiment is mirrored in quotes of prominent Latin Americans like Juan Bautista Alberdi who is known as the "father of the Argentine constitution". He stated, "Each European who comes to our shores brings us more civilization in his ways of living, which he will then pass on to our people...Perfection which is not seen or personally touched is poorly understood" (Shulman 1948, 8). And more recently president Laureano Gómez of Colombia in the 1950s is quoted as saying "In the countries where black people have disappeared like Argentina, Uruguay, and Chile… they have been able to establish...stability" (Dijk 2009, 136).

Unlike in the United States where ancestry is a key determinant of race, in Latin America how you appear phenotypically or your observable appearance is a more important determinant (Hernandez 2001, 1102). When categorizing someone as black, for instance, features such as skin color, nose size, hair texture, and lip size among other features that may be associated with black people will be taken into account. Therefore, in many Latin American countries, the race of a person is in the eye of the beholder. In this way, even two siblings can be placed within different racial categories despite having the same ancestry.

It is commonly thought that due to the prevalence of miscegenation or the interracial relationships within Latin America race is not an important societal point of focus. However, this is a misconception that most likely came about as a result of nation building efforts of the 1800s and 1900s. As Latin America entered the 20th century, many countries began trying to cultivate a new national identity after gaining their independence. With this came the idea of mestizaje. A notable contributor and proponent of this notion of mestizaje was José Vasconcelos. His essay "La raza cosmica" or "The Cosmic Race" in English talks about the creation of a fifth race through the continued mixing of all races within Latin America (Miller 2004, 2). In this way the newly independent countries in the region could exchange racial

categories such as indigenous, African, and Asian for nationalistic categories such as Mexican, Colombian, etc. (Miller 2004, 3).

While for some, mestizaje may have presented a solution to the racial stratification and issues within Latin America, it also acted as a progressive veil behind which racism and prejudice could continue to exist. One way in which this occurred was through a decrease in the legitimacy of indigenous and Afro-Latino people within contemporary Latin America. For example, with mestizaje came the "folklorization" of indigenous and Afro-Latino people (Miller 2004, 4). Through this process, indigenous people and people of African descent were relegated to the past, and their active presence and engagement with all sectors of society within Latin Americans countries was negated. Conversely, mestizos were portrayed as a facet of modernity that represented Latin America's present and future (Miller 2004, 4).

Furthermore, mestizaje presented a way to refute claims of racism and discrimination through the affirmation that all citizens of a country fell under one nationalistic umbrella. Consequently, speaking about or focusing on race and the discrimination one may face as a result of racial prejudice can lead to the victim of the discrimination being shunned or seen as racist because "it disrupts the harmony of race neutrality" (Hernandez 2001, 1098). This particular manifestation of denial can also be seen in the United States as well where claims of discrimination are often minimized by asserting "We're all American" (Bonilla-Silva 2002, 5).

Neither of these models present an acceptable foundation for conceptions of race and race relations. As stated by David Brion Davis, "It is an open question whether a society that sees every addition of white blood as a step toward purification is more, or less, prejudiced than a society that sees any appreciable trace of Negro blood as a mark of degradation (Hernandez 2001, 1101)." Davis's quote shows how both models often result in similar

societal prejudices and discrimination but simply approach it from different ends of the same spectrum. Consequently, the answer to the question Davis poses is irrelevant when examining the potential for bias in artificial intelligence. As long as inequalities exist, they can be inadvertently coded into an AI system.

The way that race has been constructed within Latin America means that race is not just a way to categorize individuals based on their physical appearance. Historically, race has acted as a determinant of socioeconomic status and place of residence among other things. And although racial discrimination and prejudice is no longer legal, discriminatory practices still exist. These compounding historical disadvantages experienced by indigenous people and people of African descent are indicative of bias being embedded in almost all forms of data that would be used in AI systems. Furthermore, it suggests that various proxy variable for race exist that could also lead to bias even if race is excluded from the data. When these aspects of inequality are paired with the frequent denial of racism within Latin America, it is very likely that the bias will go unchecked in AI systems.

## Chapter 3: Artificial Intelligence

### History of AI

It is somewhat difficult to give an exact definition for artificial intelligence. According to Tesler's Theorem "Intelligence is whatever machines haven't done yet." The theorem reflects how intelligence is often redefined to go just beyond the latest technological feat ("Tesler's Theorem and the Problem of Defining AI"). Although, in the broadest sense of the term, artificial intelligence involves "the use of a computer to model intelligent behavior with minimal human intervention" (Hamet and Tremblay 2017, 36). Although it is considered to be a relatively new technology, the concept of AI has been around since the 1950s. In 1950, Alan Turing who was responsible for the creation of the code breaking machine, The Bombe, published "Computing Machinery and Intelligence". In this article, Turing theorized how a "thinking machine" can be created, and described a method for determining if a machine is intelligent (Turing 150, 1-2). This method which is known as the Turing Test is still used today as a standard in AI. However, despite Turing's theoretical contributions to the field of artificial intelligence, it would not be until 1956 that the term artificial intelligence would be coined. In 1956, Dartmouth College held a summer workshop called Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI). In a proposal, the attendees of the DSRPAI wrote about designing a machine that can be trained with and learn from various inputs (McCarthy et al. 1955, 6).

Although its history dates back to the fifties as stated before, AI would not garner international attention until the late 1990s when IBM's Deep Blue chess playing program beat the world champion Gary Kasparov. Since this moment, the use of AI in both the private and public sector of many countries has expanded rapidly. Most modern-day implementations of AI use machine learning which applies an algorithm to data for the purpose of prediction or decision making (Marr 2019, 4). Further specialization of machine learning resulted in

deep learning which allows the computer to make its own algorithm based on the data it is given without the help of a human (Marr 2019, 4). Deep learning gained prominence in 2016 when the AI system AlphaGo beat the Go world champion, Lee Sedol (Press 2018). Within the private sector AI is prolific and has become an integral component of many companies. For instance, many sites offer a personalized user experience tailored to your wants such as in the case of Amazon or Netflix. Both of these companies give their users recommendations for items to buy or movies and series to watch based on previous purchasing and viewing patterns, respectively (Marr 2019, 30).

Although people are more familiar with the application of AI in the private sector, it is also widely used in the public sector. In the United States, AI systems are used throughout the judicial system. For instance, the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) AI system is used to determine the likelihood that a convicted criminal would commit another crime in the future which is known as recidivism. More broadly, AI is also used in facial recognition software, predictive crime mapping, and criminal risk assessments. The latter two categories heavily rely on big data in order to predict things such as where crimes are most likely to happen or the likelihood that a person awaiting trial is a flight risk.

**AI in Latin America**

In an article by MIT Technology Review Insights, it is stated that around 80% of large businesses in Latin America are utilizing AI and have created AI initiatives. Furthermore, many Latin American governments have made or are in the process of crafting national AI policies and initiatives in order to foster its growth within the country. These policies promote AI growth through loans, tax incentives, and deregulation (O'Farrell Mairal 2020).

However, in my research I will be using two completed AI systems. These systems which are being utilized in Colombia and Argentina are known as Prometea and PretorIA, respectively.

Prometea is an AI system created by the Laboratory for Innovation and Artificial Intelligence (Ialab) of the University of Buenos Aires and private entities. The system is being used to assist in decision making for a wide array of judicial cases including minor infractions such as driving under the influence, traffic accidents, social policies, government benefit eligibility, etc. The system uses an algorithm that was trained with prior rulings made by the court. After it is presented with a case, it compiles similar cases in order to establish a precedent and offers a legal opinion based on this data. For instance, if a person requests some sort of government benefit, Prometea will look at aspects of their life such as number of children, disabilities, income, and area of residence in order to find cases with similar claimants. Then based on the cases it is able to find, it will determine whether the claimant is entitled to the government benefit based on prior rulings. However, Prometea does not have the final say in the decision made by the court as that is left to the discretion of a judge.

The PretorIA AI system was actually based on the Prometea system with adjustments made so that it can function within the Colombian context. The system was developed by the Ialab, the University of Rosario of Colombia, and private entities. Unlike Prometea, PretorIA is tailored to predict outcomes for tutelas specifically. In Colombia, tutelas are judicial appeals that are filed by citizens when they believe that their fundamental rights are being infringed upon. These tutelas are reviewed by the Constitutional Court of Colombia. Pretoria analyzes the characteristics of tutelas in order to determine which cases have the highest priority, compiles relevant legislation, finds similar cases that have already been reviewed to establish a precedent, and provides suggestions on how the case should be handled. Just as in the case of Prometea, the final verdict is made by the judge and not the system.

**Bias**

For this project, bias is "the inclination or prejudice of a decision made by an AI system which is for or against one person or group, especially in a way considered to be unfair", as defined by Ntoutsi et al. (2019, 3). Although AI has unknowingly become a mundane aspect of many people's lives, there is still an air of mysticism about this sort of technology. As a machine-based technology, it is often considered to be an impartial agent that removes the emotional aspect of decision making. For this reason, the integration of AI has been looked at as a natural step towards progress especially in areas of the public sector that have long been plagued by discrimination and slow bureaucratic processes. However, AI systems have been shown to exhibit bias as well. This paradoxical "combination of coded bias and imagined objectivity" is what Ruha Benjamin has called the "New Jim Code" (2019, 3). "New Jim Code" is most obviously related to the term "Jim Crow" which refers to a system put in place following the Reconstruction Era in the United States. This system which lasted until the mid-twentieth century was composed of an amalgamation of laws, customs, and other means of force that were implemented with the goal of maintaining the racial status quo in the United States.

However, more importantly, the phrase is a play on the expression "New Jim Crow" which was coined by Michelle Alexander in her book *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. Within her book, Alexander posits that although the Jim Crow era had legally ended, its legacy lived on in a more insidious and inconspicuous manner through the justice system. The changing process Jim Crow underwent is what Reva Siegel calls "preservation through transformation" (Alexander 2012, 21).

Consequently, while legal framework, rhetoric, perceptions of what is acceptable have changed the end result for many black, indigenous, and other people of color has remained the same. The main tool of the justice system during this era of New Jim Crow is the War on

Drugs which is the number one contributor to the mass incarceration of people of color within the United States (Alexander 2012, 60). By hiding behind legality, it becomes difficult to challenge the War on Drugs initiative when the legal system is simply upholding the law. This use of laws as a shield to further a discriminatory agenda was even confirmed by President Richard Nixon's domestic chief who stated, "We knew we couldn't make it illegal to be either against the war or black, but by getting the public to associate the hippies with marijuana and blacks with heroin, and then criminalizing both heavily, we could disrupt those communities" (LoBianco 2016). Similarly, as stated before, people often think that technology exists in a vacuum outside the influence of human emotions and prejudices. Thus, programmers are able to hide behind a technologically crafted shield of objectivity in the face of discrimination claims.

Another aspect that Benjamin's "New Jim Code" shares with Alexander's "New Jim Crow" is that they both refute the claim that these technologies or policies are created within a post racial or colorblind society. However, it is this lack of acknowledgement whether intentionally or unintentionally that allows bias to be perpetuated (Benjamin 2019, 3). In fact, within the AI field, the developers are most likely to perpetuate prejudice as a result of not thinking about the ways that race and gender biases can affect the data rather than intentionally building these factors into their code. This lack of forethought can be very dangerous because AI can potentially exacerbate already existing bias and prejudice within a country (Benjamin 2019, xii).

Although the bias that AI systems exhibit is most often referred to as algorithmic bias, the bias actually stems from the data used to create the algorithm rather than the algorithm itself. Most predictive AI systems have to have training data in order to function as intended. Usually for a predictive AI system to be created, it has to be fed large amounts of data so that it can analyze it and find trends or patterns that will later be used to predict some future

event. Thus, the need for data in the creation of AI systems has made it the “new oil” (Lloyd 2018, 1). However, data is a product of the real world and when implemented AI systems become another component of already existing institutions and structures (Ntoutsi et al. 2019, 3). Therefore, data has embedded within it the prejudices and biases of the society it comes from such as racism and sexism. Just like any set of data that is being used for analysis, the data used to create AI systems should be representative of the population it will be used for. Therefore, any overrepresentation or underrepresentation of a certain group will increase the possibility of bias within a system. Any lack of acknowledgement of the possibility of bias in an AI system is especially dangerous because the benchmark for success in most predictive AI in the judicial system is the ability for the system to output the decision a lawyer or judge would have made.

**Mitigating Bias**

Two of the main principles that are most often considered when trying to mitigate bias in data driven AI systems are non-discrimination and algorithmic fairness. Žliobaitė defines an AI system that exhibits non-discrimination as one where “people that are similar in terms of non-protected characteristics...receive similar predictions, and (2) differences in predictions across groups of people can only be as large as justified by their non-protected characteristics” (2017, 1065). More vaguely Žliobaitė describes algorithmic fairness as a goal to “translate [non-discrimination] regulations mathematically into non-discrimination constraints, and develop predictive modeling algorithms that would be able to take into account those constraints, and at the same time be as accurate as possible” (2017, 1061).

The description provided by Žliobaitė is relatively general and broad. Consequently, it is difficult to implement on a large scale because it requires a consensus on what is considered fair. For instance, in the case of the COMPAS recidivism system, Propublica

declared that it was a biased system because amongst the individuals who did not reoffend those who were black were more likely to have been given a medium or high recidivism rating. Conversely, Northepoint argued that the system was not biased because at each level of the COMPAS rating scale the reoffending rate was relatively the same for every race. Disagreements like these make it difficult to make industry standard guidelines for mitigating algorithmic bias. Furthermore, the lack of consensus when paired with the lack of knowledge possessed by legislators around this topic make it especially difficult to create legislation regulating non-discrimination in AI systems.

During the preprocessing portion of the creation of an AI system, one of the easiest ways of mitigating bias is to work with clean and representative data sets (Ntoutsi et al. 2019, 6). However, even when presented with non-representative data, emerging technologies have been created to debias data by transforming and reconstructing data sets to make them more "fair". There is also the ability for programmers to supervise the construction of the algorithms of AI systems in order to detect and address correlations with the potential to create bias.

When looking at the way in which bias can be built into an algorithm through training data, some might come to the conclusion that sensitive information such as race or gender should be removed from the data set, in order to mitigate bias. However, this is not a foolproof method, because within a society with a history of discriminatory practices there will most likely be some proxy variable which could cause a similar bias. For example, in the United States, racial variables could be removed from a data set but because of the systematic oppression of certain groups and historical periods of intense segregation policies, there is a possibility that race can be very closely linked to a specific socioeconomic status or location (Ntoutsi et al. 2019, 4). However, even when close proxies are removed, this method of

creating algorithmic fairness which is often called “fairness through unawareness” has been shown to not prevent bias (Xiang 2020).

More recently, people have also called into question the connection between tech corporations and academic institutions when speaking about barriers to bias mitigation. These connections blur what is considered corporate research and what is considered academic research. The event that precipitated the increased scrutiny around this relationship was Google’s decision to fire Timnit Gebru from her position as Staff Research Scientist and the Co-Lead of Ethical Artificial Intelligence (AI) team. Earlier in her career, Dr. Gebru coauthored a paper titled “Gender shades: Intersectional accuracy disparities in commercial gender classification”. In this paper, she demonstrated that there in fact existed a disparity between facial recognition technologies' abilities to accurately identify white men and its ability to identify women or people of color in general. A key finding in her paper was that black women were 35% less likely to be recognized than white men by these facial recognition systems (Buolamwini and Gebru 2018, 7). Her findings caused pushback against the use of facial recognition systems in predominantly black neighborhoods as a means of policing.

Her continuance of researching the dangers of artificial intelligence and the ethics surrounding the field would lead to her being fired by Google. In an unpublished paper which she coauthored titled "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?", Dr. Gebru spoke about the potential risks of large language models. These risks included environmental and financial costs, the inability to thoroughly scrutinize the data being used, and their ability to be used to deceive people (Hao 2020). Dr. Gebru’s paper comes on the heels of GPT-3 which is a language model that makes use of 175 billion parameters that was unveiled in July 2020. GTP-3 has shown that artificial general intelligence (AGI) is not as far away as once thought. AGI differs from standard AI because

it can perform a number of tasks as opposed to one singular specialized task. In the case of GTP-3, the system can write poetry, write role-playing adventures, and even create simple apps (Lauret 2020).

Ultimately, Jeff Dean, Google's head of AI research, later sent an email stating Gebru was fired because the paper did not take into consideration the current research on how the issues surrounding language models can be mitigated. However, the situation raises the question of how capitalism and the attainment of their bottom dollar will affect the way in which bias and other problems related to AI are handled by corporations.

In terms of actual governmental regulation, methods of mitigating bias are underdeveloped across the globe. Currently, most countries have established national plans and guidelines that emphasize the importance of ethics being applied to the AI field in order for it to benefit society. For the region of Latin America, the Inter-American Development Bank released an initiative called fAIr LAC which is aimed at “promoting the responsible development and application of AI to improve the delivery of services – thus reducing existing disparities– and eventually reduce growing inequalities”. The fAIr LAC initiative co-opts the Organization for Economic Co-operation and Development’s (OECD) ethical standards of inclusive growth, sustainable development, human centered values and equity, transparency, explicability, robustness, security, safety, and accountability. The initiative also highlights potential challenges in adhering to these standards such as past discrimination in data sources, algorithmic bias, disparate impact, cybersecurity attacks, informed consent, and data privacy. However, despite the presence of these initiatives that provide a pathway to ethical AI development, there has been little to no substantive legislation being passed to enforce the guidelines and codes described.

## Chapter 4: Data and Methodology

In this thesis, I conduct a comparative study of Colombia, Argentina, and the United States in order to assess current and future risks associated with AI use in the judicial system and its effect on inequality. I chose Argentina and Colombia because they are both currently implementing AI systems in their public sectors. Specifically, the judicial systems of Argentina and Colombia are incorporating AI systems known as Prometea and PretorIA, respectively (Corvalán 2018, 24; Jaimovich 2020). Not only are both of these countries rapidly expanding their utilization of AI, but they also represent two ends of the spectrum for racial and ethnic composition.

Furthermore, despite the many differences between the two countries, Colombia's PretorIA system is actually based upon Argentina's Prometea system (Jaimovich 2020). The recreation of another country's AI implies that the future of AI within Latin America could be relatively uniform despite differing populations. This could be problematic if the AI system is biased or flawed in some way. Even in the event that a system functions well in one country, the varying demographics across Latin America can cause distinct results. I have also included the US as a point of comparison because unlike Colombia and Argentina its AI systems are not in their infancy and have had time to display bias. Therefore, I am able to better determine how a lack of regulation or oversight in a country with a history of racial stratification and marginalization can result in biased AI systems.

In my research, I have included an analysis of past and contemporary inequality and bias in the countries of interest with regard to the treatment of marginalized people. I will also explore how data has been used within the country to create a national narrative and address inequality. Following this, I establish the state of AI regulation within my chosen countries and present gaps in the regulation which can allow for bias in AI to go unchecked. I also made use of the web scraper Octoparse which was used to compile articles that reference

AI in the Colombian newspaper, El Tiempo, and the Argentine newspaper, La Nacion. I then did a content analysis to see how the two AI systems are presented in the news and how bias in AI systems is discussed in general. These two sections will allow me to identify possible ways in which marginalized groups have been under or over accounted for in specific data due to discrimination and prejudice. In order to further support the validity of my findings for Colombia and Argentina, I will then identify AI systems within the United States' judicial system and research the ways in which bias has or has not been found in the years following their implementation.

## Chapter 5: Historical and Contemporary Inequality

### Colombia

A decrease in indigenous populations of Colombia marked the rise in the African population in the country. Due to disease and the inhumane conditions indigenous people were forced to work under in mines, encomiendas, etc., the number of indigenous Colombians plummeted from around three or four million to just a half million from the start of the Spanish Conquest in the sixteenth century to the seventeenth century (Jaramillo 2002, 68). In order to supplement the dwindling indigenous labor force, African slaves were brought into Colombia. As a result, Colombian has one of the largest populations of people of African descent in Latin America. The size of the afro-Colombian population is to be expected when looking not only at the economic desire for slave labor but also the role Colombian played in the transatlantic slave trade. In 1537, Cartagena was established as an official port for the Spanish fleet (Landers et al. 2015, 261). It soon grew to be "by far the largest single port of [slave] debarkation in the Spanish Americas" with approximately 73,000 enslaved Africans being brought to the country between 1573 and 1640. However, this number is based on official port records and does not account for any smuggling that was done; therefore; the actual number of enslaved people that disembarked in Colombia exceeds this figure. Once in Cartagena, enslaved Africans were then distributed for sale throughout Virreinato de Nueva Granada which is modern day Panama, Colombia, Venezuela and Ecuador. In current day Colombia, the majority of the afro-Colombian population still resides near the pacific coast of the country in regions such as the Chocó.

For both indigenous and African descended people, the colonial era of Colombia represented for the most part a period of oppression and exploitation of resources, knowledge, and their bodies. During the fight for independence, nationally there was a movement towards radical republicanism. Within the context of the nineteenth century, this

republicanism entailed the espousal of ideals of citizenship and equality before the law (Farnsworth-Alvear, Palacios, and Gómez López 2017, 243). Despite this rhetoric of equality, it would not be until 1851 that the Ley de Manumisión o de Liberación de los Esclavos en la Nueva Granada was signed by president José Hilario López abolishing slavery in Colombia.

As Colombia entered into the twentieth century, it had adopted a discursive narrative that Colombia was a mestizo nation. And when faced with the reality of there being indigenous and Afro-Colombians the government projected an image of color blindness in the face of race. Many Latin American countries including Colombia were able to sustain this post-racial image internationally at least in part because of the racial democracy theory. The racial democracy theory also known as Iberian exceptionalism posited that the Latin American region was almost devoid of racial discrimination and prejudice in comparison to the United States (Peña, Sidanius, and Sawyer 2004, 749). Twentieth century scholars based this theory on the fact that there was an absence of institutionalized racism in the form of laws unlike what was seen during the Jim Crow era in the United States. Furthermore, they pointed out how common miscegenation or racial mixing was in the region (Peña, Sidanius, and Sawyer 2004, 749). With this in mind they came to the conclusion that inequalities in Latin America were the result of socioeconomic status and the residual effects of race-based systems such as chattel slavery rather than ongoing racism (Peña, Sidanius, and Sawyer 2004, 749). It is true that the remnants of slavery play a large role in the way racial and ethnic groups have evolved within Colombia. For instance, the majority of the afrocolombian population still resides in the Pacific Coast of Colombia. However, although economic, political, and cultural inequalities could no longer be judicially enforced following independence, the perceptions and ideals surrounding indigenous and Afro-Colombians had already permeated every aspect of life. The societal stratification of the dominant and the dominated persists in present day Colombia. While, location of the Cartagena slave port is the

reason why most afro-descendants in Colombia live on the coast of the country, it is the racism and prejudice that they along with indigenous people face that acts as a barrier to them finding work and a place to live in more metropolitan areas. Thus, these marginalized groups still find themselves second class citizens in their own country despite the rights that they are guaranteed by Colombian's constitution. In this way, the Colombian government was able to disregard the rampant discrimination in the country by covering it in a cloak of inclusionary language.

Furthermore, even when the Colombian government endeavored to foster a more egalitarian society, there were still episodes of nonaction throughout history. For instance, the Constitution of 1991 was considered a great achievement in the establishment of a more equal country. Under the 1991 constitution, Colombia was declared a pluri-ethnic and multicultural nation (Paschel 2010, 730). One way in which they recognized this is through anti-discrimination efforts. Article 13 of the constitution states, "All individuals shall receive equal protection and treatment from the authorities... without any discrimination...The State shall promote the conditions so that equality may be real and effective and shall adopt measures in favor of groups that are discriminated against or marginalized." Moreover, in order to support this declaration, ethnic and cultural protections were implemented, many of which established autonomy. In accordance with the constitution, the constitutional court stated that individuals in Colombia are able "to define their identity not as a citizen in the abstract sense of belonging to a territorial society and governing state, but an identity based on concrete ethnic and cultural values" (Morales Hoyos 1999, 569). The new construction of a citizen provides a stark contrast to colonial era definitions of a citizen. Especially in terms of guaranteeing, marginalized groups the right to the identities that have historically and systematically been stripped of. Consequently, indigenous laws, languages, collective

property rights, and education within communal territories were officially recognized by the Colombian government (Aldana 2018, 266).

The rights of Afro-Colombians were also expanded through the adoption of the Constitution of 1991. With this new constitution, Colombia "[recognized] Blacks as distinct cultural communities" making it one of the only two Latin American countries to include this distinction in its constitution (Aldana 2018, 266). Additionally, Law 70 also known as the Law of Black Communities was adopted two years later in 1993 for the purpose of "[obtaining] real conditions for equal opportunity alongside the rest of Colombian society" (Aldana 2018, 266). The legislation included the creation of two seats in the House of representatives for black communities, the compulsory inclusion of afro-Colombian history in schools, the right of development, and the right to be included in development projects that may affect them (Paschel 2010, 730). Despite the Colombian government's seeming dedication to progress in ethnic and racial equality, between 1998 and 2008 it did not report any anti-racial discrimination measures to the UN Committee for the Elimination of Racial Discrimination as it was obliged to do (Rodríguez Garavito et al. 2008, 8).

In addition to the government failing to enforce the constitutional standard of non-discrimination, they have fallen short in their constitutional promise to protect land rights as well. The result of this failure is extreme rates of displacement within afrocolombian and indigenous communities. The pacific coast of Colombia is composed mostly of rainforest. Historically, the region has been ignored due to its humid climate and difficult to navigate topography making it one of the poorest regions in the country. It has a relatively small population of approximately one million. Of the roughly one million people who live on the Pacific coast, ninety percent of the population is afro-Colombian (Escobar 2003, 158). There are also around 50,000 indigenous individuals also living in the region (Escobar 2003, 158). However, during the eighties, the area began to be of economic importance for those

seeking a place for new development projects, agricultural lands, and narco traffickers. Due to conflicting economic interests in the region, the Pacific coast became a battlefield for guerilla groups such as the FARC (Fuerzas Armadas Revolucionarias de Colombia), paramilitary groups like AUC (Autodefensas Unidas de Colombia), and the Colombian military (Gruner & Rojas 2018, 212). Aside from violence inflicted upon the inhabitants of the Pacific coast by paramilitary and guerilla forces in attempts to gain control of territories, residents also experience State terrorism. This is often the result of indigenous and afro-Colombian people in the region being profiled as members of groups opposing the Colombian military (Gruner & Rojas 2018, 212). These acts of state terrorism included aerial bombings as well as raids (Oslender 2007, 755). Although the state government relies heavily on the need to combat FARC rebels as a justification for their presence and acts of violence in the region, many afro-Colombian and indigenous activists say otherwise. They believe that the displacement is not random but instead the result of a concerted effort to remove them from the land. This hypothesis is supported by the fact that many of the areas most affected by the conflict are locations of interest for development projects. Activists also consider the conflict to be an instrument of assimilation. By removing groups from the lands in which they are granted autonomy, indigenous and afro-Colombian communities will find it more difficult to maintain their cultural identity (Escobar 2003, 161).

The constitution of 1991, sought to reunite indigenous and afro-Colombian people with the identity they had been stripped of during the colonial period and provide protection for these identities. Additionally, the constitution endeavored to redress historical patterns of land dispossession in the country. For people of African descent, they were originally displaced from their African homelands when they were taken as slaves. And indigenous people have been systematically pushed to the fringes of society while watching their ancestral lands become settlements for the Spanish. However, through state inaction or ill-

advised action, these marginalized groups have once again found themselves forcefully displaced from lands that they call home. The displacement that marginalized groups are facing also follow historical trends when looking at the impetus behind the violence in the coastal area. The Pacific coast has become a location of interest for macro-level development projects. The justifications for these projects are heavily entrenched in the idea of modernizing the region. Superficially, this seems beneficial; however, as stated early in this paper modernity is often heavily connected to Eurocentricity and the negative othering of non-Europeans.

Thus, the government's actions have shown that they are primarily interested in economic gains even at the expense of marginalized groups. Ultimately, the constitution of 1991 and subsequent legislation created with the purpose of achieving a more racially egalitarian society are commendable. However, their inability to stop discrimination against and the displacement of indigenous and Afro-Colombian people show that this legislation most likely cannot stop algorithmic bias from occurring and will not provide a robust enough pathway to recourse if marginalized groups are discriminated against through algorithmic bias.

**Argentina**

The colonial history of Argentina closely mirrors that of Colombia in that African slaves were brought to the country as the indigenous population dwindled (Ortega et al. 2005, 50). However, the trajectory of the two countries diverged during the nation building process that followed independence. While Colombia embraced mestizaje, Argentina embraced whiteness while excluding all other races and ethnicities (Chamosa 2008). In order to construct this myth that Argentina is a completely white country, the history of slavery and indigenous population within the country was systematically purged.

During the colonial era, Buenos Aires was an important port city for the Virreinato del Río de la Plata region which included present day Argentina, Chile, Bolivia, Paraguay and Uruguay (Ortega et al. 2005, 49). The Portuguese were the main suppliers of slaves for this region. While most enslaved Africans were sent to work in the mines of Potosí or Uspallata which are located in Bolivia and Chile respectively, records show that many also stayed in Argentina and could be found in the provinces of Buenos Aires and Santa Fé y Asunción (Ortega et al. 2005, 50). Like most occurrences of chattel slavery throughout history, the relationship between enslaved Africans and those who enslaved them in Argentina was one of domination and exploitation. The dynamics between Spanish settlers and indigenous groups in Argentina were similar. Native people were dispossessed of their land and made to work under the encomienda system paying tribute to the encomenderos who were now in control of the land (Weinberg and Mercolli 2017, 73). The racial and ethnic hierarchy that was established during the colonial period would be the foundation upon which modern day Argentina is built.

During the independence wars in Latin America, discourse surrounding ideas such as "free and equal citizenship" began to emerge. With these ideologies being the basis for calls for independence, one might believe that the status of indigenous and Afro-Argentine people might improve. The opposite was true for the majority of marginalized individuals in the country. After Argentina gained independence, as stated before aligned itself with the idea of whiteness and in doing so imposed a negative connotation on anything that was not white (Ko 2014). The demonization of black people is especially prevalent in the literary canon of the 1800s such as *Amalia* by José Mármol (1855) and *El matadero* by Esteban Echeverría (1871) (Ko 2014). The narrative that the Afro-Argentine population had been decimated by the wars and disease was also created (Sutton 2008, 107). During this same time period, whiteness was also inextricably linked to modernity and modernity was seen as the result of

the expansion and development of new lands. However, these “new” lands were already occupied by indigenous groups. During this time, the dichotomy of barbarism vs civilization was invoked in order to portray indigenous people as counterproductive to the development of a national identity of modernity. Consequently, the Argentine government launched the Desert Campaign in the late nineteenth century for the purpose of exterminating native populations in areas of interest and assimilating those who survived into the dominant culture (Ungaretti et al. 2018, 2). Thus, non-white groups in Argentina were removed from national discourse. The lands captured were then given to the Argentine elite which widened the gap between the dominant and dominated groups within the country (Weinberg & Mercolli 2017, 75).

Like many other countries in Latin America during the late twentieth century, Argentina modified its constitution and passed new legislation to acknowledge diversity and commit to establishing a more egalitarian nation. Under the Argentine constitution as amended in 1994, the state recognized indigenous ethnicities and cultures, equality before the law for all, and all international treaties that were ratified by the State as holding an equal status to the constitution. Furthermore, in 1995, the government created the National Institute Against Discrimination, Xenophobia, and Racism (INADI) (Sutton 2008, 113). However, there have been many critiques of the progressive measure. For instance, the INADI has experienced issues such as “insufficient funding, vulnerability to political change, political appointments for technical positions..., and discontinuity for project” (Sutton 2008, 113).

Furthermore, Argentina has already found itself at the center of controversy surrounding the use of facial recognition software. In April of 2019, the Buenos Aires government announced the existence of the Fugitive Facial Recognition System. The system would be connected to the subway camera system, Consulta Nacional de Rebeldías y Capturas or National Register of Fugitives and Arrests (CONARC), and identity card photos

collected by the country's population registry (Gershgorn 2021). Three weeks later the legislation necessary to launch the system was passed via a resolution rather than a law in order to speed up the process (Gershgorn 2021). Since the implementation of the system, there have already been numerous cases of individuals being wrongfully detained after being misidentified by the software.

As mentioned before in this report, studies have shown that facial recognition software often work best on white men and their margin of error increases when used on women and people with darker skin tones. This is often the result of training data largely containing only white males. And this is exactly the case for the facial recognition system being used in Buenos Aires. Documents collected by the Argentine group Asociación por los Derechos Civiles (ADC) or Civil Rights Association that in order to determine its accuracy, the system was tested only using the faces of people employed in city's police department and the Justice and Security Ministry (Human Rights Watch 2020). Based on the racial dynamics within Argentina and more specifically urban areas like Buenos Aires, it is likely that the majority of these employees were white or fair skinned. Consequently, it is likely that indigenous and Afro-Argentine citizens are more likely to be misidentified by the system. Furthermore, due to perceptions of these marginalized groups as uncivilized and thus more prone to violence as well as automation bias, their claims of innocence will most likely fall on deaf ears.

Another group that this facial recognition system may harm is children. Facial recognition systems have also been shown to misidentify children at higher rates (Human Rights Watch 2020). Furthermore, when people are caught on camera committing a crime and are identified via the facial recognition system, their information is automatically added to the publicly accessible CONARC database even in the case of children. This means that among other information the suspect's name, age, and identification number is made public

knowledge. However, according to international human rights law which Argentina has ratified making it of equal legal status to the constitution, information that may lead to the identification of a child should not be published. Despite evidence showing minors in CONARC and calls for the removal of children from the database, the Justice and Security Ministry in Buenos have not taken any action to rectify this issue and have instead denied that the database does not contain the data of minors (Human Rights Watch 2020).

Besides algorithmic errors that may arise in the system, many groups including the ADC have pointed out human error in the databases. There have been many accounts of clerical errors and discrepancies. For instance, multiple occurrences of the same person, misspelled names, and multiple ID numbers assigned to a single person (Human Rights Watch 2020). Small errors like these can lead to the wrongful detainment of innocent people and in the worst-case scenario wrongful incarceration. Although, these errors are the easiest to fix and the least time consuming it is very telling that they have yet to be addressed systematically. If small errors like this are overlooked at the city level, it is difficult to determine how these errors might accumulate and cause significant issues at the national level.

Due to the city's inaction in addressing the many issues connected to the facial recognition system, the ADC filed a lawsuit against the government of Buenos Aires. Leandro Ucciferri who works as a researcher for the ADC stated, "When we asked for privacy impact assessments or other human rights impact assessments, they're not doing that at all...They're not carrying out the studies around necessity, proportionality on the risks that this technology can bring to human, social, economic, and political rights." The government's lack of concern about the potential negative effects of facial recognition is just one example of how its actions often do not coincide with the image it projects through progressive legislation. And this seems to be a macro-level response that disregards dangers that might

affect any Argentine citizen. Thus, due to historical narratives that have disregarded marginalized groups such as indigenous and Afro-Argentine people, it is reasonable to assume that the response to these people being harmed through algorithmic error would be essentially nonexistent. Therefore, I conclude that it is more likely that algorithmic bias in national level AI systems would be similarly unregulated and lack the oversight necessary to stop the system from exacerbating already prominent inequalities in the country.

## Chapter 6: Statistical Invisibility

Within Latin America activists and academics alike have taken notice of what they have termed statistical invisibility. Statistical invisibility refers to "the precariousness in the production and systematization of disaggregated data" or data that is separated into detailed subdivisions (ILEX 2019, 19). The lack of emphasis placed on race in official data is often misconstrued as a testament to a country's commitment to the idea that all races are equal. However, realistically due to the colonial past and discrimination that certain ethnic and racial groups still encounter in their daily life, statistical invisibility is another method of exclusion and a way to cloak issues like racial and ethnic discrimination and prejudice. Furthermore, when paired with the exclusion of marginalized voices, the lack of the data can contribute to the absence of policies to better the situation of marginalized peoples and curtail discriminatory practices (Rodríguez Morales 2010, 91).

### Colombia

When looking at the importance of racial, you have to look at the greater historical context that caused the inclusion and exclusion of people of African descent from this data within Colombia. People of African descent were first included in the national census in the sixteenth century in order to provide accurate counts of slaves in the Americas (Rodríguez Morales 2010, 92). However, after the abolition of slavery in what was then the Republic of Colombia, the African or indigenous population would not be included in the census for decades. This shows that the impetus for the inclusion of indigenous and black Colombians was economic in nature. It would not be until the 1900s that afro-Colombians would once again be counted in the census but only in 1912 and 1993 (Rodríguez Morales 2010, 92). However, the wording of the questions asked in the census was at times unclear which caused the count to not accurately reflect the Colombian population. For example, the 1993

census asked if the respondent “belongs to any ethnicity, indigenous group or black community” and if so which one. The framing of the question makes it seem as though respondents should respond solely based on ethnic parameters rather than ethnic and racial parameters. Consequently, people who consider themselves to afro-Colombian responded no to the question because they did not belong to any particular culture or community that was ethnically black (Rodríguez Morales 2010, 93). The result of this confusion was that only 1.5% of the Colombian population identified as afro-Colombian in the 1993 census (Rodríguez Morales 2010, 93). The 2005 national census modified and expanded the scope of the question by asking people if they were indigenous, of African descent, etc. based upon their “culture, community, or physical features”. The rewording of the question resulted in an increase of the afro-colombian population from 1.5% as estimated by the 1993 census to 10.6% as estimated by the 2005 census. More controversy surrounded the next census that took place in 2018. Between 2005 and 2018, the Afro-Colombian population inexplicably dropped from 4,311,757 to 2,982,224. For this reason, many Afro-Colombian organizations filed a joint tutela calling for the 2018 census results to be suspended in relation to their use to determine resource allocation. However, this tutela was ruled inadmissible. Therefore, a precedent has been established that will go on to be used by the Pretoria system in its analysis of tutelas in the future.

The aforementioned lack of disaggregated data has allowed the myth that Colombia is a post racial homogenous country composed of mestizos to be perpetuated in national dialogue. Furthermore, mestizaje was often conceptualized as the mixing of Spanish and indigenous people with little reference to the inclusion of the black population (Paschel 2010, 736). Through the upholding of this myth as true, marginalized ethnic groups such as people of African descent and indigenous peoples were often discursively made invisible. For this reason, following in the footsteps of indigenous activists, starting in the late 1990s black

activists in Colombia began steeping their reformation efforts in ethnic difference discourse rather than racial equality (Paschel 2010, 731). The difference between these two frameworks within the Latin American context is that racial inequality efforts have often been associated with some form of cultural assimilation, integration, and sameness as a means to racial discrimination and inequality (Paschel 741). Conversely, ethnic difference efforts often call for the "right to a cultural identity distinct from the dominant society" through autonomy, self-governance, and land (Paschel 2010, 741). It was through this othering of themselves that indigenous people and afro-Colombians were able to achieve recognition in the 1991 Colombian constitution which recognized the country as pluri-national.

Despite the recognition of ethnic difference in the 1991 constitution, endeavors to record ethno-racial statics in Colombia are still very underdeveloped, as mentioned before. And this has allowed discrimination in many sectors to continue unchecked. For instance, in an independent case study done by ILEX Accion Juridica based in Colombia, the organization found that in regards to interactions between citizens and the police there are clear differences in the treatment of people of African descent or people with darker skin and people with lighter skin. While white or mixed people were often addressed as "senor" or "senora" (sir or miss), darker skinned people were often referred to as simply "negro" or "negro" (black) if not something worse including "simio" or "esclavo" (ape or slave) (ILEX 2019, 41). Furthermore, the study found that in the Usme and Kennedy people with darker skin were 2.67% more likely to interact with the police and 2.57% more likely to be arrested, taken to a restricted area, or fined. While the discoveries of the study show that discrimination and racism is a problem in the police force and by extension the judicial system, the problem is further exacerbated by statistical invisibility (ILEX 2019, 37).

Take for example a situation where a person of African descent has a negative interaction with a police officer that is clearly linked to his or her race. As a marginalized person, the victim of racism or discrimination may already be scared to file a complaint as a result of the power imbalance. Additionally, if they were to go through with filing a report, the person's race or ethnicity will not be recorded in conjunction with the report. Therefore, when activists call for reformation or policy changes to address racial and ethnic discrimination, they for the most part will only have anecdotal evidence to support their claims instead of statistics that show clear discrepancies between the treatment of indigenous and people of African descent. The lack of a clear target supported by governmental statistics and evidence is an impediment to the betterment of the situation of marginalized groups. Furthermore, in another instance, a group of individuals filed a tutela stating that the police had violated their right to assemble peacefully and their right to freedom during a protest on September 9, 2020 where Javier Ordóñez was killed by authorities. The court dismissed the tutela stating that they had already ruled on a similar tutela in 2019 where they determined that there was a systematic violation of the right to peaceful protest and ordered preventative protocols to be put in place to combat these violations. The lack of further action is problematic considering that the 2020 case of police brutality still occurred despite their previous condemnation of use of excessive force.

However, there are dangers to the development of governmental ethno-racial statistic databases. The principal risk associated with an incrementation of statistical data is that objective finds can become the foundation for subjective claims about the nature of certain races. For instance, in areas within Colombia where crime mapping has been done, it has been shown that some neighborhoods that have large afro-colombian populations tend to have more crime. Instead of attributing this information to poverty and lack of access to

education, healthcare, etc, these findings can be used to further racist rhetoric that portrays black individuals as inherently more violent and prone to crime (Moncada 2010).

**Argentina**

Unlike Colombia, rather than a national narrative of the country being mestizo, Argentina has positioned itself globally as a "white" country. Although Argentina is a relatively homogeneous country with over ninety percent of the population being of European descent, the rhetoric surrounding black argentine people goes far beyond an acknowledgement of this. More accurately the rhetoric surrounding people of African descent and indigenous people is a denial of non-Europeans in the country. For instance, Carlos Menem who served as president of Argentina from 1989 to 1999 once stated, "In Argentina blacks do not exist, that is a Brazilian problem."

The indigenous and afro argentine populations are quite small but not nonsexist as Menem states. The 2010 census for Argentina showed that 149,493 people self-identified as being of African descent making them around 0.37 % of the total national population. The same census recorded 955,032 people who identified as indigenous or descended from indigenous villages which is approximately 2.4 % of the national population. The reality of the racial demographics of Argentina were quite easily proven through the 2010 census which was notably the first census since the late nineteenth century that included questions about African ancestry and the second to include indigenous individuals (Ko 2014; Sutton 2008, 110).

The removal of racial categories from the census in 1887 was not an arbitrary change and must be analyzed within the context of Argentina in the 1800s. Throughout the nineteenth century, Argentine elites and politicians looked at the whitening of the country as a necessary step in the pathway towards modernity. This sentiment is reflected in the former

president Domingo F. Sarmiento's book Conflicto y armonía de las razas en América which declares, "Peru, Bolivia, Ecuador and Mexico remain in the worst state of backwardness' in contrast to Argentina, which is governed by a 'European, Christian, civilized race" (Ko 2014). Sarmiento's book was published in 1883 just nine years after the end of his presidential term and four years before the census was altered. Consequently, it can be said that the modification of the census structure was a deliberate choice. Through the removal racial categories on the census, the myth of Argentina as a purely white country was strengthened as there were no longer any statistical means by which the myth could be debunked. In addition to changes in the census during this time, campaigns to exterminate native and European immigration programs were established to further this narrative of Argentine whiteness (Ko 2014).

These acts of erasure were instrumental to the perception of race and racism in contemporary Argentina. Judith Anderson provides a person anecdote that shows this in her article "Will the Real Negros Please Stand Up? Understanding Black Identity Politics in Buenos Aires, Argentina". While in Argentina around the time of the 2008 United States election, Anderson describes a pattern of Argentine people expressing their support for Obama and congratulating the US for finally dealing with their racial problems. These same people, however, either ignore or reject the idea that similar histories of discrimination had happened in Argentina and continue to happen in the country. That is to say racism cannot exist in a country that only has one race and thus is something that only happens in other countries. However, by entrenching the idea of an "authentic" Argentine in whiteness, indigenous and Afro-Argentines are consequently perceived as anomalous, deviant, and or intruders in their own country (Sutton 2008, 109).

Through a historical lens, the current day lack of racially disaggregated data in Argentina can reasonably be considered a modern-day iteration of postcolonial nation

building campaigns that were created to erase the presence of non-Europeans. Although progress such as the inclusion of people of African descent in the census has occurred, the lack of data in the judicial sector, health care sector, etc. always the state to maintain plausible deniability. Furthermore, it forces activists and those seeking racial and ethnic equality within the country to rely on qualitative anecdotal evidence. The lack of quantitative data makes it difficult to communicate that discrimination is a systemic macro-level issue rather than a series of isolated events.

Without the inclusion of disaggregated statistics, there is no clear way to identify to where bias exists in the data and to what extent it is biased in countries such as Argentina and Colombia. Thus, it becomes more difficult to effectively clean the data and circumvent algorithmic bias in AI systems. Moreover, the bias that existed before the creation of the system has historically been denied which indicates that the State has little interest in preventing the bias from affecting AI systems. Therefore, I conclude that algorithmic bias is rampant in AI systems such as Prometea and PretorIA. Consequently, these systems will continue the historical criminalization of and discrimination against indigenous people and people of African descent rather than make the region more equal.

## Chapter 7: Regulation

### Colombia

Like many countries across the globe, AI technologies are progressing and developing faster than the regulation in Colombia. However, Colombia has adopted the aforementioned ethical principles created by OECD. Colombia also has the ability to regulate AI through its data privacy legislation. Article 15 of the 1991 constitution assures that citizens have the fundamental right to data privacy. Specifically, the Article 15 states, "All individuals have the right to personal and family privacy and to their good reputation...individuals have the right to know, update, and rectify information collected about them in data banks and in the records of public and private entities. Freedom and the other guarantees approved in the Constitution will be respected in the collection, processing, and circulation of data."

In late 2019, the Colombian government unveiled the Política Nacional para la Transformación Digital e Inteligencia Artificial (National Policy for Digital Transformation and Artificial Intelligence. The policy was passed with the aim of promoting the public implementation of digital technologies through increased innovation and technical training within the country. Although the main objective of the policy is to increase the use of innovative technologies, it does dedicate a portion of the policy to recognizing the potential risks of AI. It then presents the methods by which it plans to minimize the effects of potential algorithmic bias. These methods include collecting evidence surrounding the effects of AI on the labor market, giving universities a prominent role in the creation of AI, conducting cost-benefit analyses for all AI regulation as not to limit its creation, and the use of international talent and knowledge. The latter two methods could prove to be problematic. With regard to cost-benefit analysis, considering the lower valuation of the lives of indigenous and Afro-Colombians historically, it is possible that economic gains could outweigh the potential discrimination in AI systems. And as stated in the theory section, knowledge and

Eurocentricity are often linked which could lead to the international talent pool largely being European which in itself is not a negative but it could lead to issues related to Afro-Colombian and indigenous people being overlooked.

**Argentina**

There is not much legislation within Argentina that makes reference to artificial intelligence and those that do were often created to stimulate the growth of AI within the country rather than regulate it. In addition to adopting the AI ethics principles presented by the OCED that were mentioned earlier Argentina also has a national plan. Argentina's national AI plan, ArgenIA, does acknowledge the potential benefits of AI such as its ability to "promote more just and inclusive societies" as well as its potential to "put people's rights at risk, violate freedoms or wide gaps between and within countries". While ArgenIA does seem to effectively highlight the dangers of bias in the data and the possibility for AI to have negative effects, it seems to rely heavily on human oversight and the lack of black boxes in the development of AI. Using the black box model, algorithms are completely responsible for the creation of the AI system. Thus, it is impossible for anyone to know how inputs or variables are being combined and analyzed to make predictions (Radin and Rudin 2019). Additionally, some of the goals within ArgenIA include the creation and confirmation of an AI ethics committee and a national observatory on AI. The observatory would act as a point of contact between the public, academic, private, and civil sectors where a dialogue about the current impacts and future implementations of AI can occur.

Despite Argentina's relative lack of legislative regulations specifically for AI, it does have many protections with regards to data and privacy. The right to the protection of personal data has been covered in Argentina's constitution since 1994. Article 43 of the constitution states, "Any person shall file this action to obtain information on the data about

himself and their purpose, registered in public records or data bases, or in private ones intended to supply information; and in case of false data or discrimination, this action may be filed to request the suppression, rectification, confidentiality or updating of said data." However, recent controversy surrounding the use of facial recognition software in certain cities that will be covered later in this paper have shown that the regulations currently in place are not comprehensive enough to mitigate the potential inequalities that may arise as a result of Prometea.

**United States**

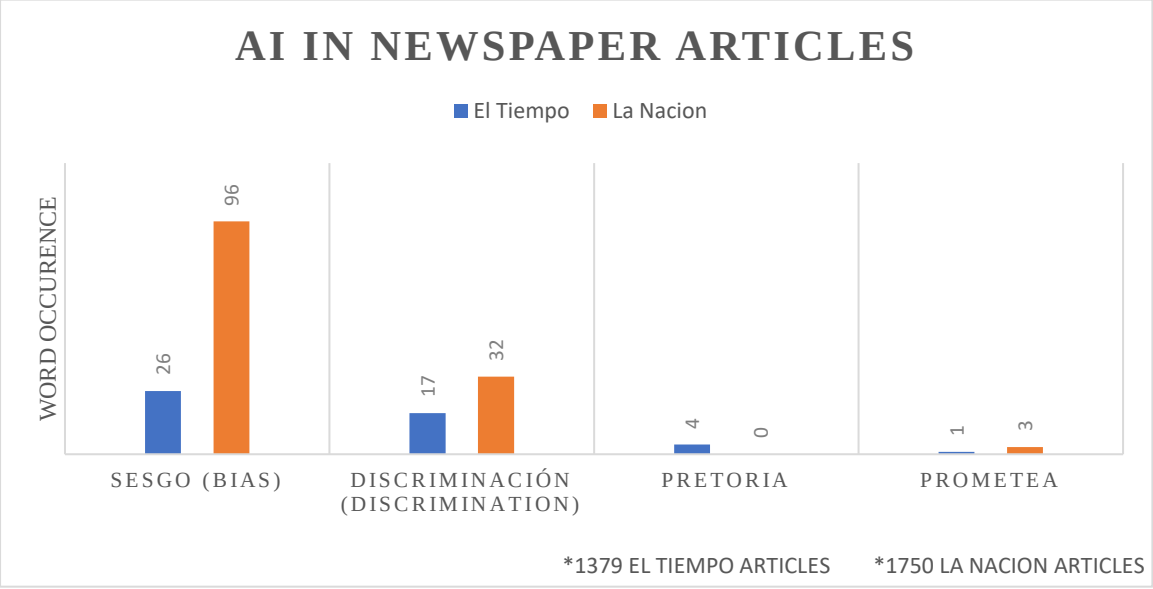
The United States is a leader in AI regulation. Like Argentina, the United States has tried to foster AI development within the country. For instance, the Executive Order on Maintaining American Leadership in Artificial Intelligence (No. 13,859) was issued in early 2019. Under this executive order, the American AI Initiative was established and outlined five primary principles including an increase in investment in AI research, the development of standards, an expansion of the AI workforce, the protection of civil liberties and privacy, and the protection of the US's lead in AI (Chae 2020, 17). Most recently, the National Artificial Intelligence Initiative Office which facilitates collaboration in the creation of AI research and policies between the governmental bodies, the private sector, and academia.

However, there are also many policies that have been written but not adopted. One such policy is the Algorithmic Accountability Act which applies to any "automated decision system". An "automated decision system" is defined as "any computational process, including one derived from machine learning, statistics, or other data processing or artificial intelligence techniques, that makes a decision or facilitates human decision making, that impacts consumers (Chae 2020, 22). If enacted would require those covered under the act to perform "impact assessments" for "high-risk" automated systems to gauge their "accuracy,

fairness, bias, discrimination, privacy, and security." The act further specifies that these assessments should be conducted by independent third parties when feasible (Chae 2020, 21). While AI regulation within the United States is more developed relative to many other countries, the continued use of systems such as COMPAS, the recidivism predictor, with little to no judicial skepticism shows that regulation does not always stop algorithmic bias from occurring, especially when the common person does not have a in depth understanding of AI. Therefore, the future of AI in countries like Argentina and Colombia seems to point towards similar if not more profound issues of algorithmic bias and inequality.

**News Paper Analysis**

Artificial intelligence is a relatively new field of science. Therefore, many of the technical aspects of AI exist outside the general public's scope of knowledge. Therefore, most people probably do not know the risks associated with AI unless they have been exposed to it through some form of media. As public knowledge of a potential issue is essential to holding the government accountable, I have collected articles from El Tiempo, a Colombian newspaper, and La Nacion, an Argentine newspaper.



Overall, a general search of “inteligencia artificial” between 2018-2020 yielded 1379 articles in El Tiempo and 1750 articles in La Nacion. The results show that there is not heavy coverage of the bias and discrimination associated with artificial intelligence in general, and there is even less coverage of Prometea and PretorIA specifically. In El Tiempo, only four articles mention PretorIA by name and three of the articles only mention it in passing. The singular article gives an in-depth description of the use of AI in Colombia’s judicial system is entitled “La reforma que plantea Fedesarrollo para modernizar a la justicia”. The main focus of the article is the ways in which artificial intelligence can benefit the judicial system. The beginning of the article describes how the Colombian justice system is experiencing “judicial congestion, slowness, and a lack of efficiency”. It then goes on to explain how many people including ex-magistrate of the Constitutional Court, Manuel José Cepeda, support the use of AI in order to reduce the effects of these issues.

There is a small paragraph that states that there is a need to establish ethical criteria for AI systems such as transparency and equality. However, the article does not explicitly state the dangers of AI and the aspects of the system that need to be regulated. In fact, more of the article addresses how AI systems can actually detect discrepancies that may be an indication of corruption or fraud within the justice system. Ultimately, as implied by the title of the article, the implementation of AI systems is portrayed as an act of modernization. Given the historical construction of modernity and modernization within Latin America which is discussed in the theory section, this can be somewhat problematic. By associating AI systems with modernity, anything that stands in the way of these systems or critiques them can easily become the enemy of progress.

In La Nacion, there are three articles that reference Prometea but only one of the articles talks about the system in detail. The article is entitled “Prometea: una inteligencia artificial para ayudar a la Justicia porteña”. Within this article, there are many direct quotes

from Juan Corvalán and Luis Cevasco who were involved in the creation of Prometea. The majority of these quotes address how Prometea is beneficial. For instance, Prometea's accuracy, speed, and ability to reduce clerical errors are highlighted. And when Corvalán and Cevasco are not pointing out the benefits of the system, they are reiterating the fact that judicial processes are not fully automated but rather Prometea is a tool to be used by "a person of meat and bone". These affirmations that actual humans are still involved in the judicial system are meant to assuage the fears of the public concerning AI. However, issues such as a lack of regulation or algorithmic bias are not addressed in the article. The lack of visibility for these types of issues shows that an accurate depiction of AI is not being presented to the public. Consequently, the general public will not have the knowledge necessary to look at AI systems critically and question the validity of predictions that appear to be biased or discriminatory.

## Chapter 8: Conclusion

Artificial intelligence systems do not exist in a vacuum, removed from the rest of the world. They are influenced by the societies that create them in a multitude of ways. AI systems are developed by humans with implicit and explicit biases. These biases can be coded into the AI systems and have an effect on the way that they function. However, even in the case that the developers themselves are completely devoid of bias, the data used to train predictive AI systems is often a reflection of the society from which it is collected. Historical trends of prejudice, discrimination, and bias or lack thereof are embedded within the data. Consequently, AI systems can exhibit algorithmic bias which perpetuates and exacerbates pre-existing inequality. Algorithmic bias is particularly dangerous because people often display automation bias meaning that they are less likely to question decisions made by automated systems.

AI systems are not intrinsically biased and have the potential to be beneficial. For this reason, many Latin American countries are beginning to implement AI systems in the public sector. However, my analysis of two Latin American countries that represent two very different histories and demographics shows that these AI systems present a very real threat to marginalized groups. In many Latin American countries, there are very stark socioeconomic disparities between different ethnic and racial groups. It very common that indigenous individuals and people of African descent experience discrimination and prejudice. Furthermore, historically these issues have been ignored and denied by the State. Even though the late twentieth century saw many Latin American countries acknowledge that they are multicultural and plurinational, the discrimination has persisted. Much of the legislation while optically appealing has not been implemented in a manner that affects real change. Thus, it is unlikely that there will not be algorithmic bias in AI systems such as PretorIA and Prometea.

It should be noted that the AI systems are not being implemented in Latin American judicial systems to the same extent as in the US. Currently, AI systems are not being used to handle complex or high stakes judicial cases. However, the governmental promotion of AI shows that its use will be greatly expanded in the future. Consequently, it is not outside of the realm of possibility that something similar to COMPAS will be implemented in the future. With this in mind, it is telling that even when equipped with the knowledge of prior cases of algorithmic bias governments in Latin America have chosen not to pass robust legislation that regulates AI preemptively. If the government cannot properly regulate the AI systems that are directly under their control in the judicial system, it is even less likely that it will be able to regulate AI systems or quickly address algorithmic bias issues in the private sector or healthcare systems.

In the future, I believe that it would be interesting to directly analyze the court cases that were used in the test training for the two AI systems talked about in this paper. As stated in my paper, the data used to train AI systems is often the root cause of algorithmic bias. Furthermore, the accuracy of Pretoria and Prometea was calculated based on its ability to replicate previous court rulings. Thus, by analyzing the court cases, it would be possible to discover if and to what extent the data is skews and, in the process, uncover the likelihood that the AI system will exhibit algorithmic bias.

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