



Can Data Discriminate?

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How to cite this paper: Fangbin Li. (2023) Can Data Discriminate? *Advances in Computer and Communication*, 4(5), 299-303. DOI: 10.26855/acc.2023.10.007

Received: September 28, 2023
Accepted: October 26, 2023
Published: November 22, 2023

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Abstract

This paper explores the consequences of data discrimination in the digital era, where data-driven systems and algorithms play a crucial role. It highlights how data discrimination manifests through biased behavior in data-driven systems, perpetuating societal inequalities and biases. Focusing on social media and big data, the analysis highlights the potential for algorithmic bias, targeted marketing practices, and the amplification of extremist content. The paper argues that data discrimination poses ethical challenges and emphasizes the need for increased transparency, fairness, and user awareness. It also addresses limitations in governing algorithmic discrimination and emphasizes the importance of interdisciplinary collaboration to tackle this pressing issue.

Keywords

Data discrimination, algorithmic bias, digital era, social media, big data

1. Introduction

The current digital era is doubtlessly experiencing a notable transformation in the way users collect, interact with, and utilize information. With the advent of technology, society has become increasingly digitized, leading to the generation of vast amounts of data. This is primarily because of the growing significance of data, which is now considered a valuable resource in decision-making in multiple areas, such as business, social communication, and even governance models [1]. As human lives become more intertwined with technology, this society is witnessing an increasing reliance on data-driven systems and algorithms to shape human experiences and decision-making.

However, this development poses a detrimental concern about the negative implications of the escalating reliance of users on data. This is why this essay argues about the repercussions of data by specifically throwing light on the concern of data discrimination. Data discrimination entails the potential for bias, inequality, and unfairness to arise in the collection, analysis, and utilization of data [2]. This paper aims to critically analyze the issue of data discrimination within the context of social media and big data. The analysis of the underlying theoretical debates can foster a deeper understanding of the challenges posed by data discrimination and identify potential strategies to mitigate its negative effects, ensuring a more just and equitable digital society.

2. Data discrimination

Data discrimination is a phenomenon that arises when data-driven systems and algorithms exhibit biased behavior or perpetuate existing inequalities and biases in society. It occurs when the analysis and utilization of data lead to unfair treatment or differential outcomes for individuals or groups based on certain characteristics or attributes [3]. The increasing reliance on data and algorithms in decision-making processes across various domains, such as employment, finance, education, and law enforcement, has brought to light the potential for data discrimination to impact people's lives in profound ways. At the core of data discrimination is the concept that data-driven systems learn and make predictions based on patterns and trends present in the data they are trained on. However, if the data used for training contains biases or reflects existing social inequalities, the algorithms can inadvertently perpetuate and even

amplify these biases when making decisions or recommendations. Biases can manifest in different forms, such as racial, gender, or socioeconomic bias, and they can lead to unequal treatment or outcomes for individuals from marginalized or disadvantaged groups.

The UK A-Level Algorithm Scandal that unfolded during the Covid-19 pandemic serves as a prominent example of data discrimination [4]. In response to the cancellation of traditional exams, an algorithm was implemented to calculate A-Level grades for students based on various factors. However, it became evident that the algorithm disproportionately affected students from disadvantaged socio-economic backgrounds. The algorithm relied on several variables, including a school's previous performance, class size, and teacher's predicted grades, to predict students' final A-Level grades. However, these variables were not sufficient to capture the full potential and capabilities of individual students. The algorithm's heavy reliance on historical data and school averages introduced biases that disproportionately impacted students from underprivileged backgrounds. In light of the ongoing debates and the example discussed here, it can be argued that the growing use of data has enabled various aspects of human life. However, this transformation also presents significant challenges, one of which is discrimination, as explored in this study.

3. Data discrimination in the digital and social media landscape

While the debates surrounding data discrimination have been addressing multiple aspects, one area where the impact of data is particularly significant is social media. This is because social media platforms have experienced exponential growth in the past few years, connecting billions of people worldwide and facilitating the exchange of information, ideas, and personal experiences. In this regard, Turow and McGuigan postulate that these platforms have become central to shaping public discourse, influencing consumer behavior, and even impacting political landscapes. Social media platforms generate massive amounts of data through user interactions, content creation, and behavioral patterns. This data is then used to derive insights, personalize user experiences, and fuel targeted advertising. While these developments have transformed the global data landscape, there are also critical repercussions, such as the rise of discriminatory actions.

In the realm of data discrimination in the digital media landscape, there has been growing concern about discrimination in Google Ads. This concern is supported by instances where bias has been observed in the results produced by the platform's algorithms. We can explain this phenomenon with the example that when users search for "black-sounding names", there is a high probability that Google Ads will display results related to arrest records. This can perpetuate negative stereotypes and contribute to the potential for unfair treatment, as argued by Sandvig et al. [5]. This gap in the search results can be explained by the underlying algorithms, which are primarily responsible for determining which ad results are displayed for such search queries.

This suggests a bias in the algorithms, which "learn over time" based on user interactions, including the clicks received by specific ad texts. Such trends and developments highlight the need for increased awareness, transparency, and scrutiny in the development and implementation of algorithms to ensure that discriminatory outcomes are minimized and users are not subjected to biased advertising experiences.

Analyzing the potential for privacy violations and discrimination within social media platforms reveals significant concerns regarding the ethical implications of their operations.

Social media platforms extensively collect users' data, which may lead to privacy issues and the potential for discrimination. These platforms employ this information for content management, as also analyzed by Dencik et al. [6]. The algorithms used are trained on vast amounts of data, including user interactions, engagement patterns, and demographic information [7]. However, depending on historical data introduces the potential for algorithmic bias as this data may inherently contain existing societal biases and inequalities. The algorithms and machine learning systems utilized by social media platforms to determine what users see can unintentionally perpetuate discrimination. For example, algorithms might prioritize or restrict the visibility of specific posts or users based on factors such as race, gender, or socioeconomic status. This can result in discriminatory outcomes, reinforcing stereotypes, and marginalizing certain groups of individuals.

Another aspect of concern is the potential for algorithmic amplification of extreme or divisive content. The purpose of social media algorithms is to enhance user engagement and time spent on these platforms, often leading to the promotion of content that is more likely to provoke emotional responses. This can result in the amplification of extremist views, fake news, and harmful content, further exacerbating societal divisions and misinformation [8].

To address these challenges, social media platforms should ensure that users have transparent access to information regarding the collection, storage, and utilization of their data. Additionally, platforms should actively work to mitigate

algorithmic bias by regularly auditing and testing their algorithms for fairness and addressing any identified biases. Gangadharan and Niklas extend these findings by referring to governmental and regulatory protocols, such as General Data Protection Regulation (GDPR), which seek to minimize the data and algorithmic discrimination. Moreover, the findings of Marwick et al. are also pivotal in this regard, who argue about the essence of promoting digital literacy and critical thinking skills among users to empower individuals to navigate social media platforms more effectively and avoid acts of privacy violations and data discrimination.

In light of these findings, it can be argued that social and digital media platforms are highly vulnerable to data discrimination. The extensive collection of personal data, algorithmic bias, and the amplification of extreme content all contribute to ethical challenges. Social media platforms must prioritize user privacy, addressing algorithmic biases, and foster an inclusive and responsible digital environment. By doing so, these platforms can work towards mitigating privacy risks and promoting a more equitable and inclusive online space.

4. Data discrimination in the big data landscape

Simultaneously, big data has emerged as a powerful force in driving decision-making processes. In recent decades, the proliferation of information, communication, and technological systems has caused an exponential rise in data generation, thereby coining the term "Big Data" [9], which primarily refers to the vast amounts of digital information that is generated and collected from various sources, such as social media platforms, online transactions, sensors, and devices. The availability of Big Data has revolutionized the way citizens interact with and handle data as well as information. This can be understood through the subsequent opening of new opportunities for businesses, researchers, and policymakers to extract valuable insights, make informed decisions, and develop innovative solutions. The sheer volume, velocity, and variety of data sets in the Big Data paradigm present both opportunities and challenges.

One crucial aspect of the availability of Big Data is its potential for discrimination in various ways. Within this context, analysts and users play distinct roles. Analysts, who possess expertise in data analysis and manipulation, sift through extensive datasets using sophisticated techniques and tools to uncover patterns, correlations, and trends. They utilize the vast reservoirs of data generated by users to extract valuable information. On the other hand, users, often unaware or only partially aware, generate the data that forms the foundation of analysis. The argument can be taken forward by resting on the example provided by Hoffmann, who postulates that in the history of computation and data processing, concerns have arisen regarding the discriminatory consequences of technological advances. Early efforts to computerize governmental records and private data stores in the United States raised worries about data collection and processing without transparency or oversight, potentially leading to unfair treatment of citizens [10]. This concern is exemplified in the credit industry, where big data analytics used in credit scoring algorithms can perpetuate biases and discrimination present in historical data. If these algorithms are trained on data reflecting historical lending practices that favored certain demographic groups or marginalized others, individuals belonging to those groups may face lower credit scores or be denied credit, perpetuating systemic inequalities. This underscores the importance of regulatory measures, transparency, and fairness in data analysis to ensure equal access to credit and address the potentially discriminatory impact of big data. The discussion and the supporting example lead us to deduce that while big data has facilitated operations and information processing to a massive extent, there are critical implications, specifically about the way this utilization of data leads to discrimination among citizens.

The availability of Big Data has also facilitated the emergence of targeted marketing practices, which can potentially lead to discrimination. Marketers leverage Big Data by conducting segmentation studies and employing advanced analytics to gain a better understanding of consumer preferences, behaviors, and needs. This enables them to tailor advertisements and marketing campaigns to specific consumer segments, aiming to enhance the effectiveness of their efforts. Consequently, consumers are increasingly exposed to a growing number of personalized advertisements designed to capture their attention and influence their purchasing decisions. This can further be explained by the arguments put forward in the study of Turow who states that the emerging use of tools like cookies and beacons to gauge the way customers do on the internet. Moreover, the authors refer to organizations like Releaf and eXelate, whose core purpose is to track customers' behaviours on the internet, thereby providing such relevant information to marketers to foster their advertising efforts. While these efforts help marketers to offer an elevated and personalized customer experience in this era of extreme competitiveness, these practices ignite biases and perpetuate discriminatory practices based on factors such as race, gender, or socioeconomic status.

The rise of Big Data presents both opportunities and challenges in the realm of information and decision-making. It has the potential to revolutionize industries, improve efficiency, and drive innovation. However, the availability of

Big Data also raises concerns regarding privacy, security, and fairness. As more data is collected and analyzed, there is a need to ensure ethical practices, safeguard individual privacy, and address potential biases or discrimination that may arise from the analysis and utilization of Big Data. In summary, the advent of Big Data signifies the exponential growth in data generated by information, communication, and technological systems. It has created distinctions between analysts and users, fuelled targeted marketing practices, and influenced the accessibility of data for scholarly research. Understanding the background of Big Data helps to contextualize the subsequent discussions on its implications, including the potential for discrimination and the need for ethical considerations.

5. Conclusion

In today's rapidly developing era of big data, algorithms have permeated various domains of our lives, such as transportation, travel, shopping, lending, and entertainment, all made possible through internet connectivity. This widespread application of algorithmic technology is accompanied by innovative ways of generating, collecting, and utilizing information in the digital age. However, this transformative shift also brings forth new challenges, particularly in the form of data discrimination. Data discrimination refers to the perpetuation of biased behavior or existing inequalities and biases in society through data-driven systems and algorithms. Pre-existing societal biases based on factors like gender, age, race, and occupation can inadvertently be reinforced and amplified by algorithms due to their reliance on historical data, user interactions, and engagement patterns. This exacerbates prejudices and discrimination, leading to adverse impacts and undermining the collective values and rights of humanity.

Furthermore, concerns about data discrimination arise within the context of Big Data due to the potential biases present in the data itself and the algorithms used for analysis. This is often exemplified through targeted marketing practices driven by Big Data. To enhance customer satisfaction and transaction efficiency, businesses customize content and advertisements to specific user preferences using data analysis and algorithms, thereby unintentionally perpetuating and perpetuating discrimination.

The issue of algorithmic discrimination severely undermines users' fundamental rights and requires urgent attention from governing bodies. Analyzing the causes of algorithmic discrimination, it can primarily be addressed by algorithm designers, users, and third-party entities such as governments, businesses, and the media. They can work together to explore ways to govern algorithmic discrimination. Since data contains a vast amount of user information, governments and industries should establish data collection standards for practitioners involved in the algorithm design process. Practitioners need to promptly document and explain information, such as data sources, collection scope, and sample sizes, in accordance with specified guidelines. They should also undergo regular supervision and review. This helps ensure the comprehensive and equitable collection of data across different groups, thereby avoiding algorithmic discrimination resulting from missing data samples or uneven sampling. Third-party entities, such as governments and businesses, should collaborate to implement joint supervision and improve relevant laws and regulations in order to establish necessary legal constraints.

Additionally, promoting digital literacy and critical thinking skills among users is crucial to empower individuals. Users need to prioritize the protection of their personal information, maintain vigilance, and guard against unfair treatment. Increasing awareness of rights protection is also vital for users.

6. Limitation

This paper examines real-world cases to explore data discrimination in the digital and social media realms within the context of the big data environment. To effectively address this issue, collaboration among relevant professionals is essential. This article provides a theoretical analysis from a sociological perspective. However, it is essential for researchers from various disciplines to contribute specific and practical solutions based on their respective areas of expertise.

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