



## SOCIAL MEDIA AND MISLEADING INFORMATION IN A DEMOCRACY: A MECHANISM DESIGN APPROACH

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### ABSTRACT

In this article, we present a resource allocation mechanism to incentivize misinformation filtering among strategic social media platforms and, thus, to indirectly prevent the spread of fake news. We consider the presence of a strategic government and private knowledge of how misinformation affects the users of the social media platforms. Our proposed mechanism strongly implements all generalized Nash equilibria for efficient filtering of misleading information in the induced game, with a balanced budget. We also show that for quasi-concave utilities, our mechanism implements a Pareto efficient solution.

### 1. INTRODUCTION

For the last few years, political commentators have been indicating that we live in a post-truth era [1], wherein the deluge of information available on the internet has made it extremely difficult to identify facts. As a result, individuals have developed a tendency to form their opinions based on the believability of presented information rather than its truthfulness [2]. This phenomenon is exacerbated by the business practices of social media platforms who often seek to maximize the engagement of their users at all costs. The algorithms developed by platforms for this purpose often promote conspiracy theories among their users [3]. Thus, social media platforms form an ideal terrain to conduct political misinformation campaigns. Such campaigns are effective tools to disrupt democratic institutions because the functioning of stable democracies relies on

common knowledge about the political actors and the processes they can use to gain public support [4]. The trust held by the citizens of a democracy on common knowledge includes that: (i) all political actors act in good faith when contesting for power, (ii) elections lead to a fair transfer of power, and (iii) democratic institutions ensure that elected officials wield their power responsibly. In contrast, citizens of democracies often have a contested knowledge regarding who should hold power and how they should use it [4]. The introduction of alternative facts can diminish the trust on common knowledge about democracy, especially if they become accepted beliefs. the trust on common knowledge can be found in the 2016 U.S. elections [5], and 2016 Brexit Campaign [6], where the spread of misinformation on social media platforms resulted in mistrust towards



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the voting results. In this paper, we seek to tackle the phenomenon of misinformation by considering a group of social media platforms whose users represent the citizens in a democracy, and a democratic government. Every post on the platforms is associated with a parameter that captures its informativeness, which takes values between two extremes: (i) completely factual and (ii) complete misinformation. In our framework, posts that exhibit misinformation can lead to a decrease in trust on common knowledge among the users [4], [7]. We consider that social media platforms pose the technologies to filter, or label, posts which can eventually diminish trust on common knowledge. Thus, the government seeks to incentivize the social media platforms to use these technologies to filter misinformation.

## II. LITERATURE SURVEY

The role of social media in contemporary democracy has become increasingly central, both as a tool for enabling communication and as a platform for distributing information. However, the pervasive influence of social media in political discourse has raised significant concerns about the spread of misleading or false information (misinformation and disinformation). Misleading information in democratic systems has the potential to skew public opinion, undermine informed decision-making, and disrupt democratic processes such as elections and policymaking. Several studies have highlighted that the spread of false or misleading content can influence voter behavior, reduce trust in democratic institutions, and polarize societies. This

phenomenon has been accelerated by the nature of social media platforms, which rely on algorithms designed to maximize user engagement. These algorithms often prioritize sensational, emotionally charged, or controversial content—traits commonly found in misleading information—thereby amplifying its reach.

Social media platforms also facilitate the creation of “echo chambers” and “filter bubbles,” where users are exposed only to information that aligns with their existing beliefs, reinforcing biases and polarizing public opinion. Research by Pariser (2011) on filter bubbles and by Sunstein (2009) on echo chambers has demonstrated how these platforms can inadvertently create environments where individuals are not exposed to diverse viewpoints, thus promoting misinformation. Moreover, automated systems like bots or fake accounts can also be used to manipulate online discussions, spread false information at scale, and influence the democratic process. A study by Ferrara et al. (2016) illustrated how bots played a role in amplifying misleading political content during elections, further highlighting the vulnerabilities of social media to manipulation.

From a theoretical standpoint, the spread of misinformation on social media can be modeled through a mechanism design approach. Mechanism design is a subfield of economics that focuses on creating systems that align individual incentives with socially desirable outcomes. In the context of social media, the objective is to design systems that incentivize users to share truthful, accurate information while penalizing the spread of



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misleading or harmful content. Several scholars have argued that social media platforms can be viewed as a mechanism where the incentives of users, content creators, and platform providers are intertwined. Platforms, in particular, often profit from user engagement, which incentivizes them to prioritize content that generates the most attention, regardless of its truthfulness. This creates a system in which misleading content can be profitable, while accurate content may not always capture the same level of user attention. In response to these concerns, a growing body of literature has examined potential solutions to reduce the impact of misleading information. One approach involves improving the transparency of algorithms that govern content distribution. By making these algorithms more transparent, users can better understand how content is selected for them, and researchers can study how algorithmic biases contribute to the spread of misinformation. Additionally, scholars have proposed integrating fact-checking mechanisms directly into the platforms. Platforms such as Facebook and Twitter have begun to implement third-party fact-checking services to assess the veracity of posts and provide users with information about the accuracy of the content they see. While these initiatives have shown promise, their effectiveness remains limited by challenges in scalability, neutrality, and consistency. Other proposals focus on adjusting platform incentives to promote the dissemination of accurate information. For example, platforms could develop reward systems for users who consistently share verified and accurate content, while penalizing those who spread

misleading or harmful information. Another promising solution involves using behavioral economics insights to influence how users interact with content. By providing users with feedback about the quality and accuracy of the content they engage with, it may be possible to reshape user behavior and reduce the spread of misleading information. Similarly, leveraging the power of social networks to create trust networks could facilitate the identification and promotion of trustworthy content. Finally, several scholars argue that regulation of social media platforms is necessary to mitigate the harm caused by the spread of misleading information. Legislative efforts such as the EU's Digital Services Act (DSA) and proposals in the United States seek to impose greater accountability on social media platforms, requiring them to take proactive measures to combat the spread of misinformation. However, this approach must carefully balance the need for accountability with the protection of free speech and the open nature of the internet. Some experts argue that any regulatory framework must involve multiple stakeholders, including governments, civil society, and platform operators, to ensure that it is both effective and fair.

### III.METHODOLOGY

The methodology for addressing the spread of misleading information on social media using a mechanism design approach begins with defining the social welfare function that reflects the public good. In this context, social welfare refers to ensuring that users are exposed to accurate, trustworthy, and diverse information, which in turn fosters informed



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decision-making and promotes the health of democratic processes. The design of the mechanism needs to account for the incentives of all stakeholders involved in the information ecosystem: users, content creators, and platform providers. The first step in the methodology is to incentivize the sharing of accurate information while discouraging the spread of misleading content. One potential solution is to develop content curation algorithms that prioritize content based on its reliability, rather than engagement metrics like shares, likes, or comments. Since engagement-driven algorithms tend to amplify sensational content, creating algorithms that prioritize accuracy over attention could help mitigate the spread of misinformation. This approach could involve integrating fact-checking systems directly into the algorithm, ensuring that content flagged as false by credible third-party fact-checkers is less likely to be promoted to users.

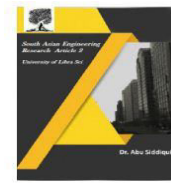
The second component of the methodology involves creating incentives for users to engage with content that is verified and accurate. For example, users who consistently engage with and share verified content could receive positive reinforcement, such as higher visibility within their social networks or other forms of recognition. Conversely, users who frequently share misleading content could be penalized, either through reduced visibility or temporary suspension of their accounts. This type of incentive structure would align user behavior with the social welfare function by rewarding accuracy and discouraging the spread of misinformation.

A key element of the methodology is the implementation of transparent and accountable content moderation processes. Transparency is vital in ensuring that users trust the system and feel that their participation in the platform is not being manipulated. Platforms should be open about how their algorithms work, how content is selected for promotion, and how decisions are made about the removal or downranking of content. Furthermore, independent audits and oversight by external organizations could help ensure that the platform's moderation processes are fair, unbiased, and effective in preventing the spread of misleading content. Behavioral economics can also play a crucial role in reshaping user behavior. Providing users with feedback on the content they engage with can help improve decision-making and reduce susceptibility to misinformation. For instance, if a user consistently engages with misleading or biased content, the platform could provide information about the potential consequences of their behavior, such as how such content might affect their perceptions of reality or the broader political landscape. Behavioral nudges like these could alter the incentives that drive users to share content, shifting the focus from engagement to accuracy and trustworthiness.

In addition to algorithmic changes, regulation and governance play an essential role in the methodology. Regulatory frameworks that mandate platforms to take active steps in preventing the spread of misleading content are necessary to hold platforms accountable for the content they distribute. Policies could require platforms to disclose the use of



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algorithms, disclose political advertisements, and create transparency reports about the steps they are taking to combat misinformation. Governments and international bodies could work together to set global standards for content moderation and misinformation detection to prevent fragmented, national-level approaches that might be ineffective or inequitable.

Finally, the methodology incorporates the need for continuous evaluation and adaptation. Social media platforms are dynamic environments that evolve constantly in response to user behavior, technological developments, and changing societal norms. Therefore, the mechanism must be adaptable to new challenges and emerging threats related to misinformation. Ongoing research, collaboration with academic institutions, and feedback from civil society are essential to the ongoing refinement of these systems.

#### IV. CONCLUSION

The spread of misleading information on social media poses a significant challenge to the integrity of democratic processes, as it undermines informed decision-making, skews public opinion, and fosters polarization. Addressing this challenge requires a multifaceted approach that incorporates elements of economics, technology, regulation, and behavioral science. A mechanism design approach offers a promising framework for creating systems that align individual incentives with the broader societal goal of ensuring the dissemination of accurate and reliable information. By prioritizing transparency, incorporating fact-checking, incentivizing

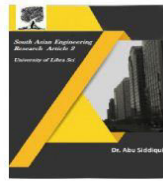
user behavior, and fostering greater platform accountability, it is possible to mitigate the harmful effects of misinformation. However, achieving these goals requires collaboration between social media platforms, policymakers, academics, and civil society to develop and implement effective solutions that protect both the integrity of democratic systems and the fundamental principles of free speech.

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