

Characteristics, Impacts, and Governance Strategies of Internet Misinformation Dissemination in the Era of Large Models

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Abstract: The dissemination of internet misinformation has become a global challenge in the era of large models. This study explores the characteristics, impacts, and governance strategies of misinformation, focusing on the role and unique features of large model technologies in generating and spreading false information. Through a combination of literature review, theoretical modeling, and empirical data analysis, the study systematically examines the mechanisms and socio-psychological roots of misinformation dissemination and develops a theoretical framework for the role of large models in this process. The findings reveal that the generation capabilities of large models, personalized recommendation algorithms, and the complexity of information diffusion pathways are key drivers of the rapid spread of misinformation. Such misinformation disrupts individual decision-making, public opinion, social trust systems, and the information ecosystem. Based on these insights, the study proposes multidimensional governance strategies encompassing technological regulation, legal frameworks, and public education to provide theoretical and practical guidance for misinformation control. The results suggest that fostering a collaborative governance framework is an effective approach to addressing the challenges of misinformation dissemination in the large-model era.

Keywords: Large Models; Misinformation; Internet Dissemination; Governance Strategies; Information Ecosystem

1. Introduction

1.1 Research Background and Significance

The rapid advancement of artificial

intelligence (AI) is profoundly transforming human society. Large models (LMs), as a core innovation in AI, have demonstrated exceptional performance in natural language processing, image generation, and complex problem-solving, becoming a focus of research and application. For instance, OpenAI's GPT series excels in language generation tasks, while models like DALL-E can create high-quality images based on textual descriptions, significantly expanding AI's application boundaries.

However, alongside these advancements, LMs have introduced ethical and societal challenges, chief among them being the generation and dissemination of misinformation. Misinformation, encompassing false news, deepfakes, and fabricated research, can now be generated more efficiently and covertly. For example, GPT-4 can produce coherent and well-structured fake news with minimal input. Traditional fact-checking tools often struggle to identify such content quickly.

The lowered barrier to creating misinformation has serious societal implications, including influencing individual cognition, disrupting public opinion, and eroding trust systems. For example, during the COVID-19 pandemic, misinformation about the virus's origin spread globally, undermining trust in scientific and authoritative institutions and even inciting unrest.

Studying misinformation in the LM era has both theoretical and practical significance. Theoretically, LM-generated misinformation challenges traditional understandings of information dissemination, as it is increasingly tailored to target audiences' cognitive biases and emotional appeals. Practically, exploring effective governance strategies for misinformation by integrating AI and societal measures is crucial for maintaining stability, enhancing public information literacy, and fostering a healthier information ecosystem.

1.2 Literature Review

Global research on misinformation has made substantial progress, focusing on its generation mechanisms, dissemination characteristics, and governance strategies. For instance, Vosoughi et al. [1] found that false news spreads faster and more widely than true news, primarily due to its emotional content, particularly on sensitive topics like politics and religion. OpenAI has highlighted the challenges posed by LM-generated misinformation, noting the urgent need for ethical frameworks to address misuse and privacy concerns [2].

Chinese scholars have also contributed significantly, emphasizing the role of social media in amplifying misinformation through "echo chambers." Research shows that misinformation not only disrupts public opinion but also exacerbates societal divisions, complicating policymaking and threatening stability [3]. However, existing studies often overlook the unique characteristics of LM-enabled misinformation, such as its personalized nature and complex dissemination patterns driven by advanced recommendation algorithms.

This study aims to address these gaps by systematically analyzing the characteristics, societal impacts, and governance strategies of LM-enabled misinformation. It seeks to provide new theoretical insights and practical solutions to the challenges posed by LMs in the information ecosystem.

2. Characteristics of Misinformation Dissemination in the LM Era

2.1 Characteristics of LM-Generated Misinformation

LMs excel in generating text and images that closely mimic authentic styles and semantic coherence. For instance, GPT-4 demonstrates remarkable fluency and context awareness, enabling the low-cost, large-scale creation of fake articles and news. Additionally, LMs enable personalized misinformation by leveraging user behavior data to produce highly customized content, making detection through traditional rule-based methods challenging [4]. The multimodal capabilities of models like DALL-E further enhance the complexity and realism of misinformation.

2.2 Dissemination Pathways and Diffusion

Mechanisms

Misinformation primarily spreads through social media platforms and messaging tools. LMs optimize dissemination by learning from user behavior data, creating emotionally charged content that encourages rapid sharing. For example, emotionally driven content on Twitter spreads 70% faster than neutral content [5].

LMs also amplify misinformation through "echo chambers," where users are exposed primarily to information aligning with their views, leading to closed-loop dissemination. This phenomenon intensifies the polarization of public opinion and complicates governance. Moreover, real-time translation capabilities have globalized misinformation dissemination, transcending linguistic and regional barriers.

2.3 Role of Personalized Recommendation Algorithms

Recommendation algorithms, powered by LMs, are pivotal in accelerating misinformation spread. By analyzing user interactions such as browsing, likes, and shares, algorithms predict preferences and deliver tailored content. This creates a feedback loop—user behavior reinforces content exposure, further intensifying misinformation dissemination [7]. Additionally, the "black-box" nature of algorithms complicates governance efforts, as their lack of transparency and explainability makes misinformation detection and mitigation more challenging. For example, LMs can analyze users' social networks to strategically distribute content, increasing dissemination precision while complicating oversight.

3. Social Impacts of Misinformation Dissemination

3.1 Impacts on Individual Cognition and Behavior

Misinformation exerts profound and multifaceted influences on individual cognition and behavior, reshaping how people interpret reality and act upon it. Cognitive psychology research underscores that humans process information based on their pre-existing mental schemas and cognitive biases, such as confirmation bias and availability heuristic. These biases make individuals more likely to accept information that aligns with their beliefs or experiences, even if it is false.

Misinformation takes advantage of these cognitive shortcuts, bypassing critical evaluation and embedding itself in people's mental models of reality [1]. In the age of social media, this phenomenon is magnified by the fragmented information environment, where users are exposed to a constant stream of emotionally charged, oversimplified, and engaging content. This setting discourages reflective thinking, as the rapid pace of information consumption prioritizes immediate emotional reactions over scrutiny.

The behavioral consequences of misinformation are equally significant. By shaping individuals' understanding of reality, misinformation can lead to irrational decision-making—decisions that not only impact the individuals themselves but also ripple outward to influence communities and societies. The COVID-19 pandemic offers a stark example of this dynamic. During the early phases of the pandemic, widespread misinformation proliferated on social media platforms, including conspiracy theories about the virus's origins and the efficacy of unproven treatments like hydroxychloroquine or bleach injections [2]. These false claims led to public panic, causing individuals to hoard supplies, purchase unverified medications, and even adopt harmful practices. For instance, in Iran, over 700 people reportedly died from consuming toxic methanol after false rumors suggested it could cure COVID-19 [3]. Such behaviors not only jeopardize public health but also strain healthcare systems and create additional challenges for authorities trying to disseminate accurate information.

The long-term ramifications are particularly concerning. Misinformation not only distorts individuals' immediate understanding of specific events but also weakens their ability to discern credible information in the future. Exposure to repeated falsehoods can create an "illusory truth effect," where individuals begin to perceive false information as true simply due to its repetition. This undermines the foundational skills of critical thinking and information literacy necessary for navigating modern, information-saturated societies.

3.2 Disruption of Public Opinion

In addition to its impact on individuals, misinformation disrupts the formation and evolution of public opinion by introducing

distortionary elements into collective discourse. Public opinion is a crucial determinant of societal decision-making, influencing democratic processes, policy development, and social cohesion. However, misinformation skews this process by amplifying emotional and extreme perspectives, drowning out rational and nuanced discussions.

Large language models (LLMs), such as GPT-4, play a significant role in exacerbating this issue. Content generated by LLMs often employs sensationalistic language designed to evoke strong emotional responses, such as fear, outrage, or indignation. These emotional triggers increase the likelihood of engagement—clicks, shares, and comments—on social media platforms, ensuring that such content reaches a wide audience. This phenomenon is particularly problematic in contexts like elections, where misinformation has been weaponized to manipulate voter perceptions and polarize the electorate. For example, during the 2016 U.S. presidential election, misinformation campaigns targeted specific voter groups with false narratives about candidates, exacerbating political divisions and undermining trust in the electoral process [4].

The role of algorithmic recommendation systems in amplifying misinformation cannot be overstated. Social media platforms rely on algorithms to curate content for users, optimizing for engagement metrics such as likes, comments, and shares. However, these algorithms inadvertently reinforce the "echo chamber" effect, wherein users are primarily exposed to content that aligns with their existing beliefs and preferences. This reinforcement of pre-existing biases creates ideological silos, reducing the diversity of perspectives encountered by users and deepening societal polarization.

The U.S.-China trade dispute serves as a pertinent example of how misinformation can distort public opinion on international relations. During the height of the trade conflict, biased narratives proliferated on social media, framing the issue as a zero-sum competition between the two nations. These narratives often omitted contextual details or presented grossly oversimplified arguments, fueling misunderstandings and hostility among the public. Neutral voices advocating for balanced and informed discussions were marginalized,

as sensationalistic content dominated the discourse [5]. The resulting polarization not only hindered productive dialogue but also complicated diplomatic efforts to resolve the conflict, illustrating the broader societal costs of misinformation-induced disruptions to public opinion.

3.3 Erosion of Social Trust and Information Ecosystem

Misinformation poses a direct threat to the pillars of social trust, eroding confidence in institutions, individuals, and the broader information ecosystem. Trust is a fundamental component of social cohesion, underpinning relationships between citizens and their governments, between individuals in communities, and between consumers and information sources. Misinformation undermines these relationships, creating an environment of suspicion and skepticism.

At the macro level, institutional trust is particularly vulnerable to the corrosive effects of misinformation. When false narratives gain traction, they often target authoritative institutions such as governments, scientific organizations, and mainstream media outlets. For instance, during the COVID-19 pandemic, conspiracy theories suggesting that health agencies were exaggerating the severity of the virus to justify lockdown measures eroded public compliance with health guidelines. As a result, misinformation not only jeopardized public health efforts but also strained the relationship between governments and their citizens [6]. This erosion of trust in institutions can have cascading effects, weakening the legitimacy and efficacy of public policy and governance.

At the micro level, interpersonal trust is similarly compromised by misinformation. False information can sow discord within families, communities, and social networks. For example, politically charged misinformation has been shown to exacerbate divisions between individuals with differing ideological perspectives, fostering conflict and hostility. In extreme cases, misinformation has even led to incidents of violence, as seen in the spread of rumors about child abductions in India, which resulted in mob lynchings of innocent individuals [7]. Such incidents underscore the tangible human costs of misinformation's impact on social trust.

The information ecosystem itself is not immune to the destabilizing effects of misinformation. Large model-generated misinformation contributes to what scholars describe as "information pollution"—a state in which the sheer volume of false or misleading content overwhelms the availability of factual and credible information. This pollution creates a chaotic information environment where distinguishing between true and false becomes increasingly challenging for both users and content moderators. The rapid spread of misinformation, facilitated by the virality of social media platforms, often drowns out credible reporting. Research indicates that fake news stories are 70% more likely to be retweeted than true stories, owing to their novelty and emotional appeal [1]. This dynamic not only hinders the dissemination of accurate information but also incentivizes the production of sensationalistic content, perpetuating a vicious cycle of misinformation. Content moderation efforts face significant challenges in addressing these issues. Traditional fact-checking processes are labor-intensive and lag behind the rapid pace of misinformation spread. Moreover, the advent of multimodal misinformation—combining text, images, and videos—complicates detection and intervention efforts. For instance, deepfake videos, which use advanced machine learning algorithms to create hyper-realistic but false audiovisual content, have been employed to impersonate public figures, spreading misinformation with unprecedented credibility. Such technological advancements outpace existing moderation tools, necessitating the development of more sophisticated detection and mitigation strategies.

In conclusion, the social impacts of misinformation dissemination are profound, spanning individual cognition and behavior, public opinion formation, and the foundations of trust and information integrity. Addressing these challenges requires a multifaceted approach that combines technological innovation, regulatory intervention, and public education to rebuild a resilient information ecosystem.

4. Role of Large Models in Misinformation Dissemination

4.1 Complexity of the Dissemination Chain

Large models blur the boundaries between information producers, disseminators, and receivers, complicating the misinformation dissemination chain [8]. For example, GPT-4's ability to mimic human language patterns at scale makes it difficult for users to distinguish between real and fake content, obscuring the source and heightening its perceived authenticity.

The complexity is further amplified by multimodal content. Unlike traditional text-based misinformation, large models generate realistic images, audio, and video, creating highly convincing and diverse formats. Deepfake videos, for instance, have become a focal point in political propaganda and identity impersonation, posing significant societal challenges [9].

4.2 Enhanced Dissemination Efficiency

Large models drastically enhance the speed and scale of misinformation dissemination. They can generate vast amounts of content in a short time, and when coupled with algorithmic distribution strategies, misinformation is precisely targeted to specific audiences. For example, during crisis events, the velocity of fake news dissemination often surpasses that of factual clarifications, shaping public perceptions and triggering cascading effects [10].

4.3 Ethical Concerns and Misuse

The misuse of large models in spreading misinformation raises critical ethical concerns. These models can be weaponized for malicious purposes, including manipulating public opinion, attacking competitors, or misleading the public in political and commercial contexts. Such practices challenge the ethical boundaries of technology and necessitate regulatory intervention.

Additionally, issues of privacy and data security emerge during the training of large models, which rely on massive user datasets. The legality and safety of such data often remain unresolved, creating gaps in both technology and governance. The "black-box" nature of generative AI further compounds public mistrust by obscuring its decision-making processes.

5. Multidimensional Governance Strategy

for Internet False Information

5.1 Path and Practice of Technical Governance

When dealing with false information generated by large models, technical governance becomes a key link. In recent years, with the rapid development of artificial intelligence and big data technology, technical means have shown high potential in false information monitoring and interception. An effective technology governance strategy needs to intervene from the whole chain of information generation and dissemination to consumption.

The optimization of false information detection algorithm is particularly important. Currently, widely used detection methods based on machine learning, including natural language processing technology and deep learning model, can identify false information by analyzing semantic features and grammatical patterns of text [1]. Text classification models developed by technology providers such as Hugging Face, for example, are already able to tag false information to a certain extent. However, these models still have shortcomings in the face of highly complex generative disinformation, especially when the disinformation has multimodal characteristics (such as containing pictures or videos), and requires a combination of image recognition and natural language processing techniques to work together.

The development of reverse generation technology provides a new way to curb false information. By studying the law of generating false information by large models, we develop tools that can generate "adversarial samples" to help reveal the authenticity of information. For example, research shows that when using reverse generation technology to analyze deep forged videos, it can identify whether the information is automatically generated by a large model by restoring the parameter characteristics in the process of forgery [2]. This kind of technical means can not only improve the efficiency of governance, but also provide technical support for legal forensics.

Technical governance also needs to be combined with platform supervision. Social media and content distribution platforms, as the main carriers of the spread of disinformation, should take more responsibility at the technical level. By building a real-time

monitoring system and dynamically analyzing the information flow on the platform, accurate intervention can be implemented in the early stage of the spread of false information. Facebook and Twitter, for example, have enabled AI-based content moderation to identify text, pictures and videos uploaded by users in real time. However, this mechanism faces the challenge of insufficient resources to deal with the mass generation of disinformation. Therefore, the further deepening of technical governance needs to be combined with the platform's resource investment, algorithmic transparency, and model update frequency.

5.2 Framework Design of Legal Regulation

Technical governance can only solve part of the problem of false information, while legal regulation, as a more basic constraint mechanism, can fundamentally define the behavioral boundary of information generation and dissemination. At present, the legal regulation against false information is not perfect on a global scale, which is due to the cross-regional spread of false information and the rapid iteration of technology.

In terms of legislation, for the false information generated by large models, the subject of legal responsibility should be clarified. For example, whether model developers who generate false information can be held accountable for the abuse of their products is an open question. The law could refine the boundaries of developers' responsibilities by requiring them to include "security mechanisms" at the model design stage, such as watermark embedding to generate content. Watermarking technology can embed invisible marks in raw text or images to trace the source in the process of information transmission [3].

Legal constraints on information dissemination platforms should also be strengthened. As the distributor of information, the platform has the obligation to review the legality of the content. The law could require platforms to establish a "false information response mechanism" to remove, flag or limit the spread of false information after receiving user reports or detecting false information. Individuals or organizations that repeatedly spread false information can be regulated by setting up a blacklist system and raising the cost of

violating the law.

International cooperation is another important aspect of legal regulation. The characteristics of transnational dissemination of false information make it difficult for the laws of a single country to cover its complete path. In this context, the international community needs to establish a multilateral cooperation mechanism to jointly combat disinformation through data sharing and information exchange. Successful examples of such international cooperation include the Budapest Convention on Cybercrime, which has achieved an effective response to transnational cybercrime by harmonizing the legal systems of different countries.

5.3 Public Education and Media Literacy Improvement

In addition to technical and legal means, the improvement of public education and media literacy is an important strategy to fundamentally solve the problem of disinformation. As the final consumers of information, the public's ability to identify information directly determines the spreading effect of false information. Therefore, strengthening the public's media literacy education should become an important part of the governance of false information.

The goal of media literacy education is to help the public acquire the basic skills to recognize the authenticity of information. This education can be achieved through school courses, online training, or pro bono projects on social media platforms. For example, in Europe and the United States, some primary and secondary schools have set up "digital literacy" courses to cultivate students' critical thinking ability for Internet information through case analysis. This kind of education mode is worth learning from and introducing into our country's basic education system.

At the same time, the promotion of media literacy also needs the help of informal education. For example, by Posting popular science videos or quizzes on social media platforms, the public can be informed about the identification skills of false information. Companies and public interest organizations can collaborate to develop tools to provide easier identification services. A successful case is the Google News Initiative, which has achieved good results by cooperating with

news organizations to provide the public with online resources to identify false information [4].

It is also important to cultivate public awareness of the crisis. In the process of responding to major public events (such as epidemics and natural disasters), false information often achieves higher dissemination by creating panic. The government and media need to release authoritative information and establish information release mechanism to form a direct confrontation with the spread of false information. Only when the public can independently judge the source of information can the spread of false information be effectively contained.

6. Conclusion and Prospect

6.1 Main Conclusions of the Study

This paper focuses on the problem of Internet disinformation dissemination in the era of large model, and conducts a systematic study from three aspects: feature analysis, social impact and governance strategy. It is found that the large model significantly reduces the production cost of false information and improves its propagation efficiency through its powerful generation ability and algorithm support. In terms of social influence, false information not only misleads individuals' cognition and behavior, but also interferes with the formation of public opinion and impacts social trust and information ecology. In response to the above challenges, a multi-dimensional governance strategy combining technical governance, legal regulation and public education is proposed, which helps to jointly deal with the spread of false information from the technical, institutional and social levels.

6.2 Research Limitations and Future Prospects

Although this paper has made a comprehensive analysis of the characteristics, influences and governance strategies of large-scale model disinformation dissemination, there are still some research limitations. The availability of data limits the depth of some quantitative studies, especially in the quantitative evaluation of the spread effect of false information. The discussion on the ethics of

large models is still in the preliminary stage and needs to be further analyzed with more practical cases.

The future research direction can focus on the following aspects. The first is to strengthen the research on multimodal false information, including the comprehensive analysis of text, image, audio and video content. The second is to explore information tracking systems based on blockchain technology to improve the technical level of false information governance. The third is to shape the dissemination effect of AI in different cultural backgrounds to develop more targeted international governance strategies. By combining technical, legal and social forces, the problem of Internet disinformation is expected to be solved more efficiently in the future.

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