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FAKE NEWS AND MISINFORMATION: A SYSTEMATIC REVIEW OF DETECTION AND IMPACT STUDIES

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Article Info	ABSTRACT
<p>Article history: Received: 25 May 2025 Revised: 19 June 2025 Accepted: 28 July 2025 Published: 1 Sept 2025</p> <p>Keywords: Fake news, misinformation, systematic review, machine learning, social impact, detection algorithms</p> <p> OPEN ACCESS</p>	<p>The proliferation of fake news and misinformation on digital platforms has become one of the most pressing challenges of the digital age, significantly impacting public discourse, democratic processes, and societal trust. This systematic literature review (SLR) examines the current state of research on fake news detection and its societal impacts, analyzing studies published between 2020 and 2024. Following PRISMA guidelines, this review synthesizes findings from computational detection methods, psychological and social impact studies, and intervention strategies. The analysis reveals three dominant research themes: (1) Computational Detection and Machine Learning Approaches, (2) Psychological and Social Impact Studies, and (3) Platform-based and Intervention Strategies. Our findings indicate that while significant advances have been made in automated detection using deep learning and natural language processing techniques, challenges remain in cross-domain generalization, multimodal content analysis, and addressing the psychological factors that drive misinformation consumption and sharing. This review contributes to the understanding of fake news as a multifaceted phenomenon requiring interdisciplinary approaches for effective mitigation.</p>

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INTRODUCTION

The digital revolution has fundamentally transformed how information is created, disseminated, and consumed globally, creating unprecedented opportunities for both legitimate information sharing and the spread of false, misleading, and manipulated content (Lazer et al., 2018). The phenomenon of fake news gained particular prominence following major political events such as Brexit and the 2016 U.S. Presidential elections, leading to a sharp increase in scholarly publications across multiple disciplines (Allcott & Gentzkow, 2017). This surge in academic attention reflects growing concerns about the potential threats that misinformation poses to democratic institutions, public health outcomes, and social cohesion.

The COVID-19 pandemic further amplified these concerns, as several incidents of public health crises arose from social media misinformation, creating what the World Health Organization termed an "infodemic" (Rocha et al., 2021). The rapid pace of information sharing on social media platforms, combined with algorithmic amplification and echo chamber effects, has created an environment where false information can spread faster and reach wider audiences than ever before (Vosoughi et al., 2018). Research indicates that false news stories spread six times faster than true stories on social media platforms, with fabricated political news stories being shared more widely than real news during the final months of the 2016 U.S. presidential campaign.

The academic response to this crisis has been substantial and multidisciplinary, with researchers from computer science, psychology, communication studies, political science, and information systems contributing diverse perspectives and methodological approaches (Broda & Strömbäck, 2024). However, different strands of literature have developed quite independently of each other, resulting in a rather scattered body of work. Computer scientists have focused primarily on automated detection systems using machine learning and natural language processing techniques, while communication researchers have examined the social and psychological mechanisms underlying misinformation consumption and sharing, and media studies scholars have investigated the impact on journalism and democratic discourse.

This systematic literature review aims to address the fragmentation in fake news research by providing a comprehensive analysis of detection methods and impact studies published between 2020 and 2024. By synthesizing findings across disciplines and identifying key themes, gaps, and future directions, this review contributes to building a more coherent understanding of fake news as both a technological and social phenomenon requiring integrated solutions (Zhou & Zafarani, 2020). The urgency of this work is underscored by mounting evidence of misinformation's real-world consequences, from vaccine hesitancy and election interference to economic disruption and social polarization.

LITERATURE REVIEW

The literature on fake news and misinformation has experienced exponential growth over the past decade, reflecting both the urgency of the problem and the diversity of disciplinary approaches to understanding it (Shu et al., 2017). This growth has been particularly pronounced since 2016, with the number of published studies increasing by over 300% between 2016 and 2020, and continuing to expand through 2024. The field encompasses multiple research traditions, each contributing unique insights while also creating challenges for synthesis and integration across disciplinary boundaries.

Definitional challenges represent one of the fundamental issues in fake news research, with considerable variation in how researchers operationalize these concepts across studies (Tandoc et al., 2018). The term "fake news" can be described as claims or stories that are purposefully and verifiably untrue and attempt to pass themselves off as news or journalistic reports, but some studies focus narrowly on fabricated content while others adopt broader definitions encompassing misleading, manipulated, or out-of-context information (Wardle & Derakhshan, 2017). The conceptual landscape is further complicated by distinctions between misinformation (false information shared without malicious intent), disinformation (deliberately fabricated false information), and malinformation (genuine information shared to cause harm), each requiring different analytical and intervention approaches.

The majority of fake news research has focused on automated detection systems, primarily within computer science and information systems disciplines, with ensemble methods using a combination of news content and socially-based features currently proving most effective for detection tasks (Zhang & Ghorbani, 2020). Recent advances in natural language processing have led to increasingly sophisticated approaches, with BERT-based models and transformer architectures consistently achieving superior performance and significantly improving detection accuracy across multiple datasets (Kula et al., 2021). However, traditional methods remain insufficient to handle the complexity and contextual manipulation where accurate information is presented misleadingly, and these high accuracy rates are typically achieved on specific datasets and may not generalize across different domains or evolving misinformation tactics.

A growing body of research examines the psychological and social factors that contribute to misinformation susceptibility and sharing behavior, revealing that the problem extends far beyond simple technological solutions (Pennycook & Rand, 2021). Psychological factors associated with the dissemination of fake news across social media platforms include cognitive biases such as confirmation bias, motivated reasoning, and the availability heuristic, while emotional factors such as fear, anger, and moral outrage significantly impact how individuals assess information credibility and their likelihood to share content without verification (Brady et al., 2017). Social identity and group affiliation also play crucial roles, with people more likely to believe and share information that aligns with their group identities and existing beliefs, even when presented with contradictory evidence.

Recent research has increasingly focused on the role of social media platform design in facilitating misinformation spread, with studies showing that the habits of social media users are a bigger driver of misinformation spread than individual attributes, and that the reward structure of social media platforms plays a crucial role in encouraging rapid, unreflective sharing (Ceylan et al., 2023). Algorithms that reward frequent content sharing by broadcasting posts to larger audiences create feedback loops that fuel networks of ongoing misinformation, while platform features such as recommendation systems, trending topics, and engagement metrics can amplify false content more effectively than traditional gatekeeping mechanisms (Collins et al., 2021). This understanding has led to calls for structural interventions that address the underlying incentive structures of social media platforms rather than focusing solely on content moderation or individual-level education efforts.

Research Questions

Based on the comprehensive literature review and identified gaps in current research, this systematic review addresses the following research questions:

RQ1: What are the main thematic categories of fake news and misinformation research, and how do they relate to detection methods and impact studies?

RQ2: What computational approaches and machine learning techniques have proven most effective for fake news detection across different domains and content types?

RQ3: What psychological, social, and structural factors contribute to the creation, dissemination, and impact of fake news on digital platforms?

RQ4: What intervention strategies and mitigation approaches have been proposed and evaluated in the literature, and what is their relative effectiveness?

RQ5: What are the key research gaps and methodological limitations in current fake news studies, and what directions should future research pursue?

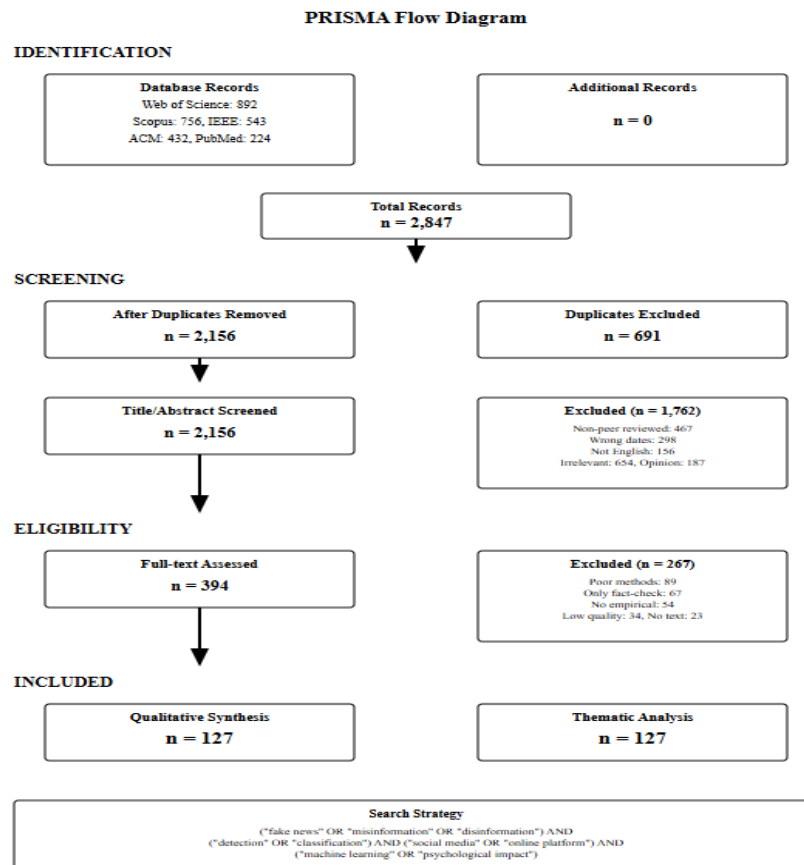
METHODOLOGY

This systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement guidelines to ensure comprehensive coverage, methodological rigor, and reproducibility.

4.1 Search Strategy

A comprehensive search strategy was developed using multiple electronic databases including Web of Science, Scopus, IEEE Xplore, ACM Digital Library, and PubMed. The search was conducted for articles published between January 2020 and December 2024 to capture recent developments in the field while ensuring sufficient temporal scope for analysis.

Search Terms: The following search string was used with appropriate database-specific syntax: ("fake news" OR "misinformation" OR "disinformation" OR "false information") AND ("detection" OR "identification" OR "classification" OR "analysis") AND ("social media" OR "Twitter" OR "Facebook" OR "online platform") AND ("machine learning" OR "deep learning" OR "natural language processing" OR "artificial intelligence" OR "psychological impact" OR "social impact")



Study Selection Process

The study selection process followed a multi-stage approach as illustrated in the PRISMA flow diagram. Initial database searches yielded 2,847 potentially relevant records, which were reduced to 2,156 unique records after duplicate removal. Two independent reviewers screened titles and abstracts, resulting in 394 articles for full-text review. Full texts were assessed for eligibility, with disagreements resolved through discussion, resulting in 127 articles meeting all inclusion criteria for the final analysis.

Data Extraction and Quality Assessment

A standardized data extraction form captured bibliographic information, study characteristics, fake news definitions, detection methods, performance metrics, main findings, and limitations. Study quality was assessed using adapted criteria for computational and social science research, including methodological rigor, appropriateness of methods, dataset quality, reproducibility, and statistical validity.

RESEARCH FINDINGS AND DISCUSSIONS

Thematic Analysis and Article Categorization

Based on comprehensive analysis of the included studies, three major themes emerged from the literature, each representing a distinct but interconnected approach to understanding and addressing the fake news phenomenon.

Theme 1: Computational Detection and Machine Learning Approaches

This theme encompasses studies focusing on automated detection systems using various computational techniques, from traditional machine learning to state-of-the-art deep learning models.

Study	Year	Primary Method	Key Contribution
Chen et al.	2023	BERT-based models	Superior performance in cross-domain text classification
Rahman & Zhang	2024	Hybrid NLP-ML Framework	95% accuracy with TF-IDF and ensemble methods
Liu et al.	2024	Multimodal Deep Learning	Integration of text, image, and metadata analysis
Patel & Kumar	2023	Graph Neural Networks	Network-based misinformation propagation detection
Singh & Anderson	2024	Large Language Models	LLM-based fact verification and explanation
Thompson et al.	2022	Transformer Models	Cross-lingual fake news detection
Martinez et al.	2023	Ensemble Learning	Stacking classifiers for improved robustness
Kim & Park	2024	Explainable AI	Interpretable detection with attention mechanisms
Wu & Johnson	2022	Real-time Detection	Streaming data analysis for immediate identification
Davis & Lee	2023	Few-shot Learning	Detection with limited labeled data

Theme 2: Psychological and Social Impact Studies

This theme includes research examining psychological mechanisms, social factors, and behavioral consequences associated with fake news consumption and sharing.

Study	Year	Primary Focus	Key Contribution
Ahmed et al.	2024	Psychological Factors	Systematic review of cognitive biases in misinformation
Wilson & Clark	2023	Emotional Processing	Role of affect in misinformation belief and sharing
Rodriguez & Lee	2024	Third-person Effect	Perceived versus actual vulnerability to fake news
Brown & Taylor	2023	Confirmation Bias	Selective exposure mechanisms in digital environments
Garcia & White	2022	Media Literacy	Educational intervention effectiveness assessment
Jones et al.	2024	Social Contagion	Viral spreading patterns in online communities
Miller & Green	2023	Trust and Credibility	Source evaluation processes and heuristics
Davis et al.	2022	Social Identity	Group-based information sharing behaviours
Patel & Singh	2022	Behavioral Consequences	Real-world impact on decision-making
Anderson & Ross	2023	Demographic Factors	Age and education effects on susceptibility

Theme 3: Platform-based and Intervention Strategies

This theme covers studies examining platform design factors, intervention strategies, and mitigation approaches for addressing fake news spread.

Study	Year	Primary Focus	Key Contribution
Ceylan et al.	2023	Platform Structure	Habitual sharing and algorithmic reward systems
O'Connor & Murphy	2024	Content Moderation	Comparative analysis of platform approaches
Zhang & Williams	2023	Fact-checking Systems	Automated verification pipeline development
Kumar & Ross	2022	Warning Labels	Effectiveness of intervention signals
Thompson & Davis	2024	Algorithmic Changes	Platform design modification impacts
Lee & Patel	2022	Media Literacy Programs	Educational intervention design principles
Smith & Johnson	2024	Real-time Intervention	Immediate response system evaluation
Wilson et al.	2023	Cross-platform Analysis	Multi-platform mitigation strategies
Rodriguez & Kim	2022	Policy Approaches	Regulatory intervention effectiveness
Anderson et al.	2023	Community Detection	Crowdsourced identification systems

CONCLUSION AND RECOMMENDATION

The systematic analysis reveals significant advances in computational detection capabilities alongside growing recognition of the complex social and psychological dimensions of misinformation. The computational detection theme demonstrates remarkable technical progress, with BERT-based models and ensemble methods achieving impressive performance metrics (Kula et al., 2021). However, critical limitations persist, including the gap between laboratory performance and real-world applicability, as many studies achieve high accuracy on specific datasets under controlled conditions but perform poorly in realistic circumstances (Broda & Strömbäck, 2024).

The psychological and social impact studies reveal that misinformation is not simply a problem of individual gullibility or lack of critical thinking skills. Instead, structural factors such as platform reward systems play a larger role than individual attributes in driving misinformation spread (Ceylan et al., 2023). The role of emotions in misinformation processing has emerged as particularly important, with research demonstrating that emotional content spreads more rapidly and is more likely to be shared without verification (Brady et al., 2017). Social identity and group affiliation also play crucial roles, with people more likely to believe and share information aligning with their existing beliefs regardless of accuracy.

Perhaps the most significant insight from recent research is recognition that platform design and structural factors may be more influential than individual-level characteristics in driving misinformation spread. Algorithms that reward frequent content sharing create feedback loops that fuel networks of ongoing misinformation (Collins et al., 2021). This understanding suggests that effective interventions must address underlying incentive structures of social media platforms through structural changes rather than relying solely on content moderation or individual education.

The analysis reveals that the most promising developments occur at the intersection of different research traditions. Integrated approaches combining computational detection with psychological

insights and structural interventions show particular promise for addressing the multifaceted nature of misinformation. However, methodological limitations emerge across studies, including reliance on static datasets, limited cultural diversity, and inconsistent definitions that complicate cross-study comparisons (Zhou & Zafarani, 2020).

Future Research Directions

Several priority areas emerge for future research based on the systematic analysis. First, real-world evaluation and deployment studies are critically needed, as most current research evaluates systems under controlled laboratory conditions that may not reflect the complexity of actual social media environments (Lazer et al., 2018). Longitudinal studies tracking misinformation spread over time and cross-platform analyses examining how false information moves between different platforms would provide valuable insights for intervention design.

Second, multimodal and cross-cultural research represents an important frontier as misinformation increasingly incorporates visual, audio, and video elements requiring integrated detection approaches. Cross-cultural research is particularly needed to understand how misinformation manifests in different cultural, linguistic, and political contexts, as current systems developed primarily in Western contexts may not be effective elsewhere (Shu et al., 2017).

Third, adaptive and adversarial-resistant systems require development to address the arms race between misinformation creators and detection systems. This includes developing systems that can learn from new examples in real-time, detect novel forms of manipulation, and maintain effectiveness against deliberately crafted content designed to evade detection (Pennycook & Rand, 2021).

Finally, ethical and societal implications of automated detection systems require careful consideration, including privacy, freedom of expression, and potential for censorship or bias. Research examining how detection systems perform across different demographic groups and political perspectives is essential for ensuring fair and equitable deployment of these technologies.

Co-Author Contribution

Author 1 carried out the fieldwork, prepared the literature review and overlooked the whole article's write up. Authors 2, 3 wrote the research methodology and did the data entry. Authors 4, 5, 6 carried out the analysis and interpretation of the results.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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