



LEVERAGING DATA SCIENCE TO MITIGATE THE PROLIFERATION OF FAKE NEWS IN UGANDA:

A Comprehensive Data Driven Approach and Future Directions

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BACKGROUND OF THE STUDY

The increasing incidence of false news in the digital age presents a serious challenge to democracy, public trust, and societal stability. In response to this difficulty, academics are using data science technologies such as data analytics, natural language processing, and machine learning to automate the detection of fake news.



PROBLEM STATEMENT



Fake news is a growing concern that undermines information integrity, erodes public trust in media, and threatens democratic processes. Despite efforts, it continues to spread, posing severe consequences like influencing elections and inciting violence. To combat this, there is a need for innovative solutions using data science techniques to detect, mitigate, and prevent fake news. Current methods rely on manual fact-checking, but machine learning and natural language processing have shown promise. However, challenges include large annotated datasets, extracting meaningful features, evolving online communication, and potential bias. This research aims to evaluate the effectiveness of machine learning algorithms and feature extraction techniques in detecting fake news and identifying sources.

OBJECTIVES

Main objective:

To review the current state of research on using data science to detect fake news, identify ethical considerations, and propose future research directions.

Specific Objectives:

- Investigating the characteristics and dynamics of fake news propagation.
- Developing machine learning algorithms, data-driven strategies for fake news detection, classification and debunking fake news content
- Analyzing the effectiveness of existing fact-checking mechanisms and debunking efforts.
- Exploring the role of social networks, online communities, mechanisms and other factors in the dissemination of fake news.
- To assess the impact of fake news on individuals, communities, and the broader society.

RESEARCH QUESTIONS

- What features of news articles are most indicative of their veracity, and how can these features be extracted and analyzed using natural language processing techniques?
- How can machine learning algorithms, data tools and techniques be trained and utilized to distinguish between fake and legitimate news sources?
- What factors contribute to the virality and spread of fake news on social media platforms and other online fora?
- What ethical considerations and challenges should be taken into account when developing and deploying fake news detection systems, and how can these considerations be addressed?

Scope of the study

This study analyzes fake news on Ugandan online news platforms, social media networks, and forums using various datasets. It uses machine learning models to analyze textual content, metadata, user interactions, and network structures. The research also explores ethical challenges in combating fake news.

Justification of the Study

The study investigates the spread of fake news, highlighting its threats to democracy, public trust, and social cohesion. It aims to develop effective strategies and interventions using interdisciplinary collaboration and data-driven approaches, fostering a more informed and resilient society in the digital age.

Significance of the Study

The significance of this research lies in its potential to generate actionable insights, innovative solutions, and evidence-based recommendations for combating fake news and promoting a more informed, resilient, and trustworthy information ecosystem in the digital age.

METHODOLOGY

Data Collection Methods

Primary Data Collection:

- Online Survey: Administered to a stratified random sample of social media users, gathering demographic information, usage patterns, and exposure to fake news.
- In-depth Interviews: Conducted with select survey participants to explore their experiences with fake news, perceptions of contributing factors, and its impact on beliefs and behaviors.

Secondary Data Collection:

- Systematic Review: Examining academic and gray literature on fake news and its societal impact, utilizing a structured search strategy to identify relevant studies.

Analytical Techniques

Quantitative Analysis:

- Statistical Analysis: Utilizing SPSS software for descriptive and inferential statistics to summarize survey data and explore relationships between variables.

Qualitative Analysis:

- Thematic Analysis: Employing NVivo software for coding and categorization of interview data, identifying key themes and patterns.

CONCLUSION

This research reviews data science techniques for detecting fake news, focusing on machine learning and natural language processing. It analyzes ethical considerations like bias, transparency, and privacy. The review highlights gaps in the literature, including the need for more research on the effectiveness of different techniques and their ethical implications.