Chapter 22
An Analysis and Detection of Misleading Information on Social Media Using Machine Learning Techniques

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ABSTRACT

The widespread adoption of user-generated material on social networking sites enables the gathering of individuals. The internet has grown in popularity based on multidisciplinary information sources. Nowadays, every individual has constantly bombarded the internet with information, and it is very challenging for every person to distinguish between factual and misleading information. Social networking sites mainly rely on content providers to filter the information. The chapter has focused on political news where the machine learning-based hybrid approach has been used to detect false statements. The work is to determine the information is deceptive or accurate. The authors investigate the link between publisher attitude and news stance, and the hyperpartisan media sources are more prone than other resources to propagate false information. Furthermore, they show that this is not required to examine news and information to recognize misleading headlines, but that utilizing variables such as publisher bias, user interactions, and news-related pictures may obtain equivalent results.

INTRODUCTION

Fake news is low-quality material intended to deceive readers and propagate misleading information. The consumption of news via social networks has increased significantly in recent years. As per the Pew Research Center, 64 percent of the population believe that fake news confuses basic facts about current events. According to recent Twitter research, false news spreads considerably more quickly and deeply than trustworthy news. The information shared by individuals had significantly fewer followers and was less active on Twitter. Human behavior has significantly contributed to the spread of fake news than real news, mainly when the information corresponds to their previously existing views and beliefs. Furthermore, botnets are equally responsible for spreading malicious and misleading statements, and different factors influence the significant spread of fake news on Twitter. There are varieties of false information that are classified as follows:

1. For the sake of enjoyment
2. For unrelated material, create a false picture or headline.
3. We are sharing incorrect and unjustified information.
4. Rumors circulated by followers.

Various research has focused on detecting and classifying false news on social media sites like Facebook and Twitter. Fake news has been categorized into several categories on a conceptual level; this information is generalized by using machine learning (ML) models across different areas. They were extracting linguistic features like n-grams from textual articles and training multiple machine learning models like K-Nearest Neighbor (KNN), Support Vector Machine (SVM), Logistic Regression (LR), Linear Support Vector Machine (LSVM), Decision Tree (DT), and Stochastic Gradient Descent (SGD). The SVM with logistic regression achieved the highest accuracy. As per the study, the accuracy level of a specific article dropped as the number of n-grams computed grew. For learning models, the classification of misleading information has been categorized by integrating textual characteristics with auxiliary information such as social interactions on social media. We were able to improve accuracies using different models. The writers also talked about sociological and psychological theories and how they might spot fake news on the Internet. Here authors also addressed several data mining methods for model creation and feature extraction approaches.

Machine Learning Approach

Machine learning techniques are divided into four branches:

- **Supervised Learning:** It works on the set of unlabeled data. There are various algorithms like Artificial Neural Networks (ANN), K-Means, Bayesian Belief Networks (BBN), etc. are works on the supervised learning technique. These algorithms use to train the normal data, and while adjusting the parameters classification of the data is performed (Sinha & Keshari, 2021).
- **Unsupervised Learning:** The unsupervised learning method characterize the structure of data which is not dependent on previously labeled data. The algorithm like clustering and outlier detection works well in unsupervised machine learning techniques (Sinha et al., 2019).

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