

Automatic Fake News Detection using Machine learning

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Summary Today, media and the information they carry play an unquestionable role in every aspect of a modern society. Over the past decade, internet became the most popular way of spreading information and *news*. Many websites however publish unreliable news or *fake news* for financial or political purposes, which can have severe and considerable impacts. Detecting fake news remains a cumbersome task for two reasons: (1) as shown by a recent study [4], humans, and more specifically students, are not trained to properly detect them, and (2) the average number of news posted on the web is estimated over 92,000 articles per day, reinforcing the need for efficient automatic tools.

The foremost challenge associated with the aforementioned problem comes from the scarcity of publicly available datasets leading to the inefficiency of Machine Learning (ML) models [1]. One of the first studies which addresses this issue was proposed in [7], however the dataset contains only 221 short statements, making it difficult to use advanced machine learning techniques, such as neural-network. A more recent work proposed in [8] provides a dataset with around 13K manually labeled short statements, claiming that people usually read news on social media/networks where the published news are in form of short sentences; In [5], they introduced another dataset where the reliable articles have been taken from reliable sources, and the fake ones have been fabricated by AMT workers. Their extracted corpus contains only 480 articles and in their case, both fake and real news share the same writing style, which is not usually the case in real life.

There exists a large body of research on the topic of ML methods for deception detection. The problem itself can be seen as a classic text classification problem. For instance, [2] reported that simple NLP based models have proven insufficient for the classification task, often failing to account for important context information. Rather, these methods have been shown useful only in tandem with more complex methods of analysis, including semantic information, sentiment analysis and language patterns [3, 6, 8].

Expected results

- Theoretical:
 - (i) An extensive literature review on automatic fake news detection approaches.
 - (ii) Survey on fake news datasets and existing tools.
 - (iii) Developing a novel hybrid model for automatic fake news detection, using both machine learning techniques and linguistic based approaches.
- Practical:
 - (i) Contributions to FACT, a novel dataset created by our team which contains 38,990 web articles, or news with their associated labels.
 - (ii) Implementation of the developed model.
 - (iii) Experiments on various datasets.

Keywords: fake news detection, natural language processing, machine learning.

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