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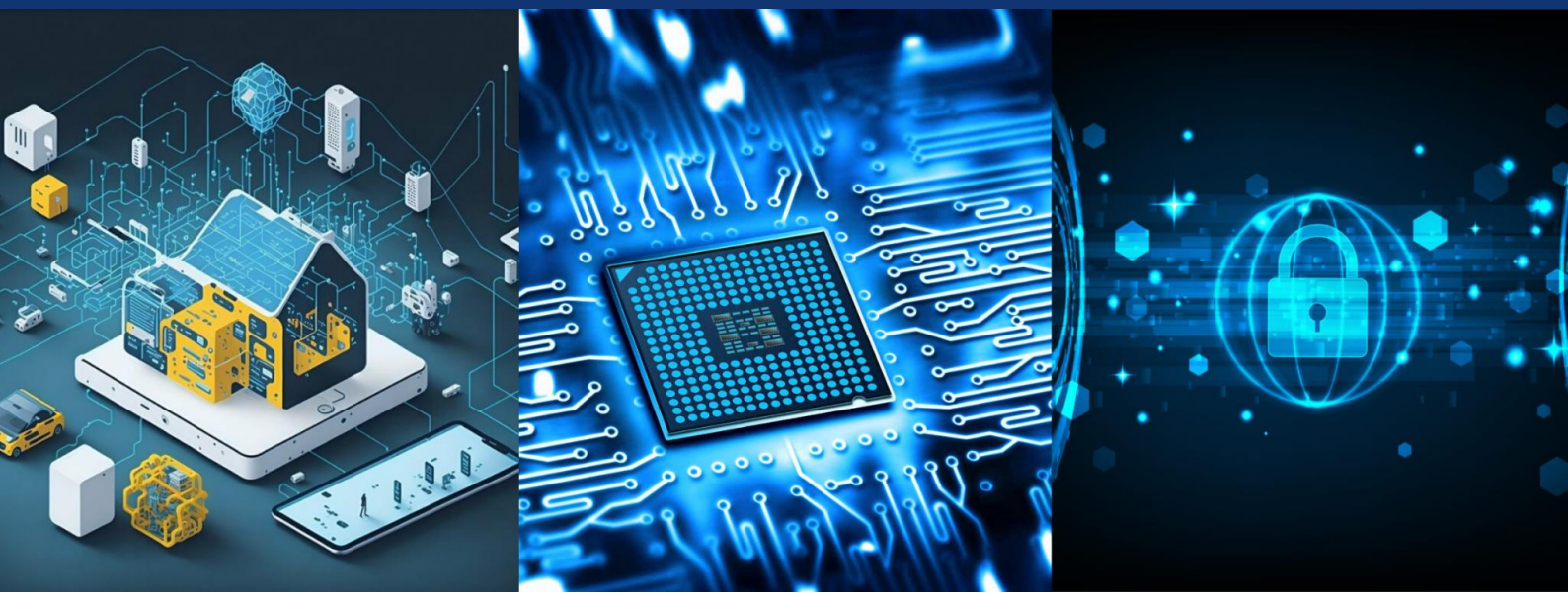

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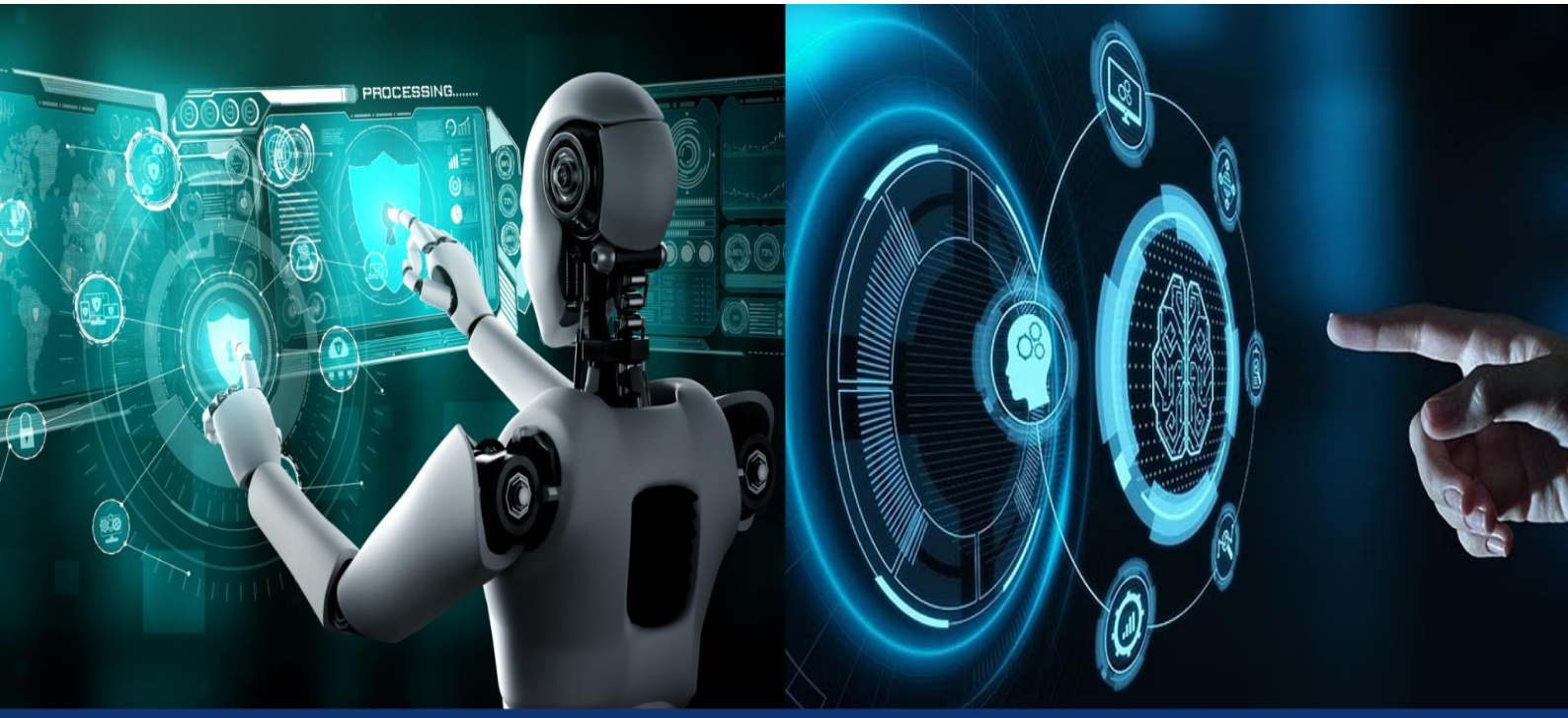

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Deepfake detection test using Artificial Intelligence and Machine Learning

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ABSTRACT: Fake news is becoming a growing concern, with the potential to influence public opinion and cause social chaos. As a result, there is an urgent need to develop effective fake news detection systems. The three main types of fake news detection approaches are content-based, social context-based, and knowledge-based. Content-based approaches analyse the news's content, such as text, images, and videos, to identify characteristics that are indicative of fake news. Text analysis, sentiment analysis, and credibility analysis are examples of such techniques. Knowledge-based approaches detect fake news by utilising external knowledge sources such as databases, ontologies, and external facts.The social context-based approach focuses on analysing the social context in which the news is being shared. This can include analysing the behaviour of the users sharing the news, the network structure of the users, and the diffusion patterns of information.

Existing fake news detection solutions take one of three approaches: linguistic, knowledge-based, or social context-based. Here, we suggest a hybrid methodology for identifying fake news that includes both knowledge-based and content-based methods. We also divide the fake news into different categories according to its content. In comparison to other methods, our experimental results show that the proposed approach detects fake news with high accuracy.

KEYWORDS: Fake news detection, Content-based approach, Knowledge-based approach, Social context-based approach, Text analysis, Sentiment analysis, Credibility analysis, External knowledge sources, Hybrid methodology, High accuracy detection.

I. INTRODUCTION

The spread of fake news has become a big challenge in the digital environment in recent years. With the rise of social media and online news sources, distinguishing between authentic news and fraudulent information has become increasingly challenging. As a result, there is an increasing demand for dependable and effective systems capable of detecting and identifying fake news.

To fulfil this demand, a new method that blends the capability of natural language processing with knowledge-based reasoning has evolved. This hybrid linguistic and knowledge-based approach leverages both linguistic features and background knowledge to identify and verify the accuracy of news articles.

This system is built around a sophisticated linguistic analysis that evaluates the content and structure of news articles. The system analyses the language used in an article using machine learning algorithms to identify patterns that are indicative of fake news. The tone, sentiment, and style of the writing, as well as the presence of certain words and phrases commonly used in fake news articles, are examples of linguistic features.

The proliferation of fake news on social media and other online platforms is a growing concern that has significant implications for public opinion, public safety, and overall trust in information. Despite efforts to counter it, fake news continues to spread quickly and easily, often having a profound impact on public opinion and behavior. The aim of this project is to develop an effective and efficient solution for detecting and categorizing fake news using a combination of machine learning algorithms and knowledge-based approaches.

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II. LITERATURE REVIEW

The rapid development of different social media and content-sharing platforms has been largely exploited to spread misinformation and fake news that make people believing in harmful stories, which allow to influence public opinion, and could cause panic and chaos among population. Thus, fake news detection has become an important research topic, aiming at flagging a specific content as fake or legitimate. The fake news detection solutions can be divided into three main categories: content-based, social context-based, and knowledge-based approaches.

1) A Hybrid Linguistic and Knowledge-Based Analysis Approach for Fake News Detection on Social Media(2024)
Authors: Noureddine Seddari , Abdelouahid Derhab, Mohamed Belaoued , Waleed Halboob , Jalal al-muhtadi , and Abdelghani Bouras
The rapid rise of social media platforms has made it easier to spread fake news, influencing public opinion and causing panic. Detecting fake news has become a crucial research area, with solutions mainly classified into content-based, social context-based, and knowledge-based approaches. This paper proposes a hybrid fake news detection system combining linguistic and knowledge-based features. Linguistic features include title, word count, reading ease, lexical diversity, and sentiment, while fact-verification features involve website reputation, coverage, and fact-check results. Using only eight features, the system achieves 94.4% accuracy, outperforming individual approaches and proving effective in detecting fake news with fewer resources.

2) A Novel Hybrid Multi-Thread Metaheuristic Approach for Fake News Detection in social media (2023)
Authors: Gungor Yildirim
In fake news detection, intelligent optimization seems to be a more effective and explainable solution methodology than the black-box methods that have been extensively used in the literature. This study takes the optimization-based method one step further and proposes a novel, multi-thread hybrid metaheuristic approach for fake news detection in social media. The most innovative feature of the proposed method is that it uses a supervisor thread mechanism, which simultaneously monitors and improves the performance and search patterns of metaheuristic algorithms running parallel.

3) A Systematic Literature Review and Meta-Analysis of Studies on Online Fake News Detection (2022)
Author : Robyn C. Thompson, Seena Joseph and Timothy T. Adeliyi
The ubiquitous access and exponential growth of information available on social media networks have facilitated the spread of fake news, complicating the task of distinguishing between this and real news. Fake news is a significant social barrier that has a profoundly negative impact on society. Despite the large number of studies on fake news detection, they have not yet been combined to offer coherent insight on trends and advancements in this domain. Hence, the primary objective of this study was to fill this knowledge gap. The method for selecting the pertinent articles for extraction was created using the preferred reporting items for systematic reviews and meta-analyses (PRISMA). This study reviewed deep learning, machine learning, and ensemble-based fake news detection methods by a meta-analysis of 125 studies to aggregate their results quantitatively. The meta-analysis primarily focused on statistics and the quantitative analysis of data from numerous separate primary investigations to identify overall trends.

4) Evaluating the Effectiveness of Publishers' Features in Fake News Detection on social media (2022)
Author : Ali Jarrahi, Leila Safari.
With the expansion of the Internet and attractive social media infrastructures, people prefer to follow the news through these media. Despite the many advantages of these media in the news field, the lack of control and verification mechanism has led to the spread of fake news as one of the most critical threats to democracy, economy, journalism, health, and freedom of expression. So, designing and using efficient automated methods to detect fake news on social media has become a significant challenge. One of the most relevant entities in determining the authenticity of a news statement on social media is its publishers. This paper examines the publishers' features in detecting fake news on social media, including Credibility, Influence, Sociality, Validity, and Lifetime. In this regard, we propose an algorithm, namely CreditRank, for evaluating publishers' credibility on social networks. We also suggest a high accurate multi-modal framework, namely FR-Detect, for fake news detection using user-related and content-related features. Furthermore, a sentence-level convolutional neural network is provided to properly combine publishers' features with latent textual content features.

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5) Fake News Detection Techniques on social media: A Survey (2022)
Author: Ihsan Ali, Mohamad Nizam Bin Ayub, Palaiahnakote Shivakumara, Nurul Fazmidar Binti Mohd Noor
Social media platforms like Twitter have become common tools for disseminating and consuming news because of the ease with which users can get access to and consume it. This paper focuses on the identification of false news and the use of cutting-edge detection methods in the context of news, user, and social levels. Fake news detection taxonomy was proposed in this research. This study examines a variety of cutting-edge methods for spotting false news and discusses their drawbacks. It also explored how to detect and recognize false news, such as credibility-based, time-based, social context-based, and the substance of the news itself. Lastly, the paper examines various datasets used for detecting fake news and proposed an algorithm.

III. METHODOLOGIES

The major challenges that hinder the efficiency of the existing fake news detection solutions are related to the highly versatile nature of deceptive information. Indeed, it is very difficult to obtain a generalized dataset for fake news detection. Thus, it is very difficult to extract relevant features that can well represent and allow to detect fake news in various domains. Some existing solutions rely on ontologies in order to model fake news domain knowledge, which can be then used to distinguish fake from real news content. As previously discussed, the existing fake news detection solutions are linguistic-based, knowledge-based, or social context-based. Considering the limitations of the aforementioned categories, it would be a good idea to investigate combining two different categories in order to overcome their respective limitations.

Proposed Method: We propose a hybrid fake news detection system that combines linguistic and knowledge-based approaches. It also discovers the category of fake news.The proposed fake news detection system is divided into two stages: training and testing.The feature extracting task extracts a set of relevant features from the training dataset during the training phase, which are then fed to several machine learning algorithms to build a fake news detection model.The detection model is applied on test data during the testing phase to determine whether the provided news articles are real or fake.
Functional Requirement : The software requirements specification is the first step in the requirements analysis process. It lists requirements of a particular software system. The following details to follow the special libraries like **tensorflow, keras, matplotlib.**
Non-Functional Requirement : Process of functional steps

- Define Problem
- Preparing data
- Evaluating algorithm
- Improving results
- Prediction the result

Conclusion of Methodology: The deepfake detection test for the is designed as a modular, scalable, and lightweight system that ensures seamless differentiation of real and fake. The architecture follows a three-tier structure, comprising:

- Web development: HTML, CSS and Bootstrap (for frontend), python, flask (for backend)
- AI & ML: different libraries like matplotlib, pandas, numpy
- Data Analysis: Juypter Notebook application

IV. SYSTEM OVERVIEW

The deepfake detection test for the is designed as a modular, scalable, and lightweight system that ensures seamless differentiation of real and fake. The architecture follows a three-tier structure, comprising:
1. Frontend (HTML, CSS, JavaScript, Bootstrap): Provides an interactive user interface, allowing students, educators, and administrators to input queries and receive responses in real time.
2. Backend (Python Flask): Manages query processing, response retrieval, and API interactions, ensuring efficient handling of user requests.
3. Database (JSON File Storage): Stores FAQs, predefined responses, and chatbot logs, enabling fast query retrieval and structured data organization

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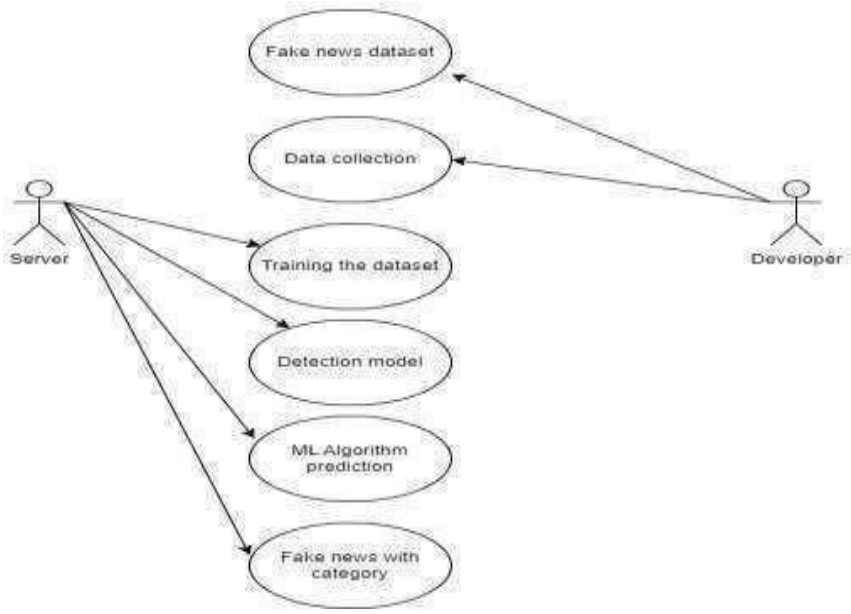
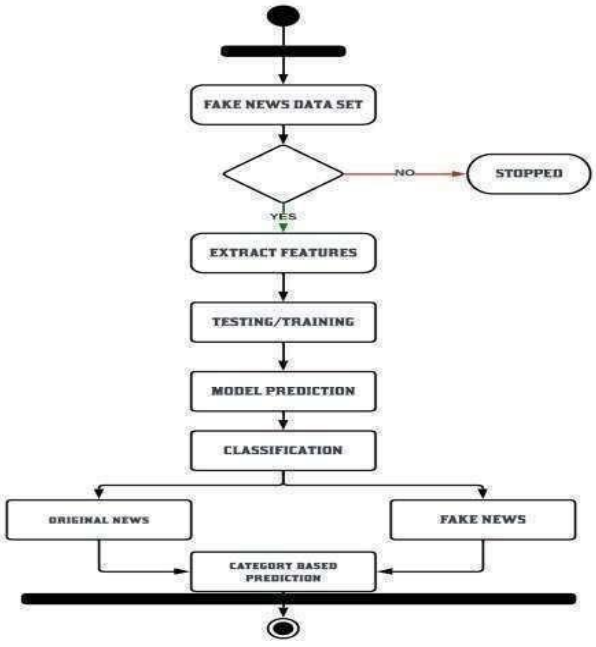
Flow Diagram: The application follows a structured data flow to process queries and deliver accurate responses efficiently.

- **Use case Diagram :** Use case diagrams are considered for high level requirement analysis of a system.when the requirements of a system are analyzed the functionalities are captured in use cases.



- **Activity Diagram:** A graphical representation of an executed set of procedural system activities and considered a state chart diagram variation. Activity diagrams describe parallel and conditional activities, use cases and system functions at a detailed level



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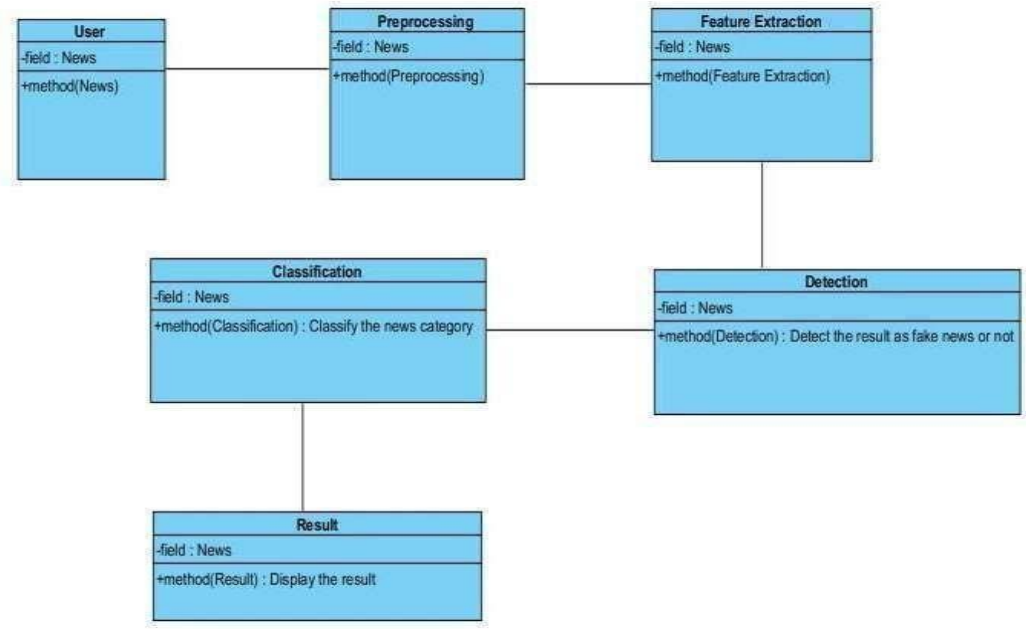
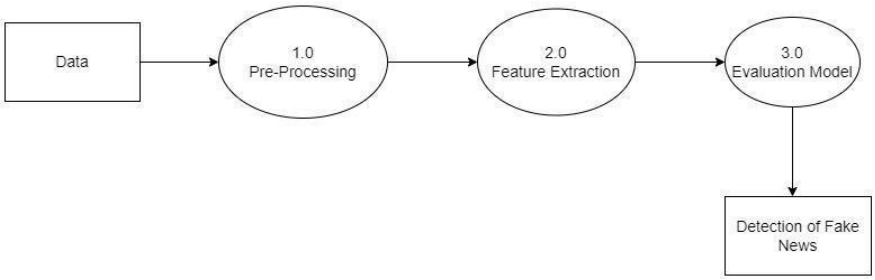
- **Class Diagram:** Class diagram is basically a graphical representation of the static view of the system and represents different aspects of the application. The name of the class diagram should be meaningful to describe the aspect of the system. Each element and their relationships should be identified in advance.



- **Data Flow Diagram:** A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects.It can be used for the visualization of data processing (structured design).Data flow diagrams are also known as bubble charts. DFD is a designing tool used in the top down approach to Systems Design. DFD levels are numbered 0, 1 or 2, and occasionally go to even Level 3 or beyond. DFD Level 0 is also called a Context Diagram.

1. **Level 0**

2. **Level 1:**



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V. CONCLUSION

In this project, we have proposed a novel hybrid fake news detection system that employs two types of features: linguistic and fact-verification features. The proposed detection system employs only eight features, which less compared to the stat-of-the-art approaches. It operates in two phases: training and testing. In the training phase, the detection system runs four machine learning algorithm. As future work, we aim at improving the accuracy of our detection system by investigating other discriminating features such as visual-based and style-based features.Moreover, we plan to further detect other types of false information such as biased/inaccurate news and misleading/ambiguous news.

The project's future scope is that fake news detectors can help to filter different websites that contain fake news, and the goal is to help users avoid being drawn in by misleading headlines. With some modifications, the project can also be used on many social media platforms where there is a massive amount of fake data that can cause harm to society. To avoid detection, fake account creators are constantly changing their tactics. Future research could concentrate on developing machine learning models that can adapt to these changing tactics while still detecting fake accounts.

REFERENCES

1. Yildirim, G. A novel hybrid multi-thread metaheuristic approach for fake news detection in social media. ApplIntell (2022). https://doi.org/10.1007/s10489-022-03972-9
2. Jarrahi, A., Safari, L. Evaluating the effectiveness of publishers' features in fake news detection on social media. Multimed Tools Appl 82, 2913–2939 (2023). https://doi.org/10.1007/s11042-022-12668-8
3. Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake News Detection on Social Media: A Data Mining Perspective. ACM SIGKDD Explorations Newsletter, 19(1), 22-36. https://doi.org/10.1145/3137597.3137600
4. Wang, W. Y. (2017). "Liar, Liar Pants on Fire": A New Benchmark Dataset for Fake News Detection. Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics, 422–426. https://doi.org/10.18653/v1/P17-2067
5. Zhou, X., Jain, A., Phoha, V. V., & Zafarani, R. (2020). Fake News Early Detection: A Theory-Driven Model. Digital Threats: Research and Practice, 1(2), 1-25. https://doi.org/10.1145/3372824

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