# Real Time Fake News Detection System Using Multinominal Naïve Baiyes

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**Abstract -** Fake news has become a significant challenge in the digital age, spreading misinformation that impacts society. A Fake News Detection System aims to identify and prevent the spread of false or misleading content by analyzing news articles, social media posts, and other online information the system is designed to be fast, accurate, and secure, ensuring user privacy and compliance with data protection laws. It also learns and improves over time using new data and user feedback. By providing real-time detection and insights, the system helps individuals, organizations, and platforms combat misinformation effectively and promotes the sharing of truthful information.

*Index Terms:* —*Detect Fake or real News, Python Django, Naïve Bayes Algorithm.*

## 1. INTRODUCTION

The Fake News Detection System using is a Python Django web project with a SQLite database that aims to tackle the problem of identifying fake news articles. The project involves the use of the Multinomial Naive Bayes algorithm for classifying news articles. The system is easy to maintain, user-friendly, and can detect fake news without any human supervision. The project comprises two major modules, User and Admin, with various sub-modules, including sign-up, login, news detection, view results history, edit profile, change password, and logout for users, and login, dashboard, view results history, view registered users, change password, and logout for admins. The system is critical in preventing the spread of false information, and the project's use of machine learning techniques ensures that the detection of fake news is accurate and efficient The proposed Fake News Detection system in Django aims to address this challenge by utilizing machine learning and natural language processing (NLP) techniques to automatically assess the credibility of news articles. Django, a powerful web framework, serves as the foundation for building a user-friendly interface where users can submit articles for analysis. Social media has been in our lives for centuries and has reached even in remote villages. Even though social media has made life in the view of interacting with people, some people spreading and posting fake news has been a major problem for the past few decades. One of the sectors greatly impacted by this new paradigm is the information industry. In the last years, there has been an exodus of users from the more traditional media such as newspapers, radio and television to new formats social networks, YouTube, podcasts, online journals, news applications, etc.

## 2. LITERATURESURVEY

### 1. Fake News Detection on Social Media : A Data Mining Perspective

**Authors**: Kai Shu, Amy Sliva, Suhang Wang, Jiliang Tang, Huan Liu
**Summary**:
This paper categorizes fake news detection into content-based and context-based detection. It highlights how textual and user behavior features can be combined for better performance. It also outlines various datasets and challenges in this area.

**Key Contribution**:

- Introduced a hybrid model combining content and social interaction features.
- Discussed data mining challenges in social media.

## 2. Fake News Detection Using Machine Learning Algorithms: A Systematic Review

**Authors**: S. Alam, S. A. M. Gilani, A. M. Khan
**Summary**:
This paper provides a review of ML techniques such as SVM, Naive Bayes, Random Forest, and deep learning methods. It also explores performance evaluation metrics and highlights preprocessing importance.

**Key Contribution**:

- Systematic comparison of traditional ML vs. deep learning models.
- Insights into challenges like data imbalance and feature selection.

## 3. Detecting Fake News with Machine Learning: An Ensemble Approach

**Authors**: Ahmed H., Traore I., Saad S.
**Summary**:
The authors propose an ensemble model combining multiple classifiers like Decision Trees, SVMs, and Random Forests. The dataset used includes news headlines and body content. The ensemble method outperforms individual classifiers.

**Key Contribution**:

- Ensemble method achieved higher accuracy than single classifiers.
- Emphasis on combining linguistic and metadata features.

## 4. Fake News Detection Using Bidirectional LSTM Model

**Authors**: A. Ruchansky, S. Seo, Y. Liu
**Summary**:
This paper introduces a deep learning model called "CSI" which combines three modules: Capture (user response), Score (user reliability), and Integrate (news content). It uses BiLSTM for textual data.

**Key Contribution**:

- Deep learning approach using sequence modeling with BiLSTM.

- Incorporates user behavior for contextual accuracy.

## 5. BERT for Detecting Fake News: A Deep Transfer Learning Approach

**Authors**: D. Kaliyar, A. Goswami, P. Narang
**Summary**:
This paper uses BERT (Bidirectional Encoder Representations from Transformers) for detecting fake news. It shows how transfer learning significantly improves accuracy even with limited labeled data.

**Key Contribution**:

- Deep learning approach using sequence modeling with BiLSTM.
- Incorporates user behavior for contextual accuracy.

## 3. OBJECTIVE

The objectives of the Fake News Detection System project using Python are:

1. To develop a Django model that can accurately detect and classify fake news articles.

2. To create a user-friendly web-based platform for users to submit news articles for detection and receive results.

3. To improve awareness of the prevalence of fake news and the importance of fact-checking in modern society.

## 4. METHODOLOGY

The methodology for fake news detection using the Multinomial Naive Bayes algorithm involves several systematic steps, beginning with problem definition and culminating in model evaluation and optional deployment. The primary objective is to classify news articles as either fake or real based on their textual content using a supervised machine learning approach. The first step involves data collection, where a labeled dataset containing news articles and their corresponding truth labels (fake or real) is gathered from sources such as Kaggle or the LIAR dataset.

Once the data is collected, the next phase is data preprocessing. This involves cleaning the text by converting it to lowercase, removing punctuation, numbers, and stop words, and applying stemming or lemmatization to reduce words to their base forms.

Tokenization is also performed to break down the text into individual words. After preprocessing, the textual data is converted into numerical features using the Bag of Words model with the help of a CountVectorizer, which counts the occurrences of each word in the documents and creates a document-term matrix

## 5. RESULT AND MODEL

Fake News Detection System divided in two main modules:

**Admin:-**

1. Login: The admin can log in to the system using their credentials.
2. Dashboard: The admin can view the total number of registered users and the total number of news articles that have been analyzed by the system.
3. View Results History: The admin can view the results of the news articles that have been analyzed by the system.
4. View Registered Users: The admin can view the list of registered users of the system

**User:-**

1. Signup: Allows users to create an account by providing their basic details such as name, email, and password.
2. Login: Allows registered users to log in to their accounts using their email and password.
3. News Detection: Enables users to input news articles or links and submit them for fake news detection.
4. View Results History: Allows users to view the results of the fake news detection analysis performed on the news articles submitted by them.

Following feature extraction, the target labels (fake or real) are encoded into numerical values (typically 0 and 1) using a label encoder. The dataset is then split into training and testing subsets to allow for model training and unbiased evaluation. The Multinomial Naive Bayes model, which is particularly suited for text data represented as word counts or frequencies, is trained on the training data This model uses Bayes' Theorem under the assumption of feature independence and a multinomial distribution of word occurrences to predict the probability that a given news article belongs to either the fake or real class.

Once the model is trained, it is evaluated on the test data using metrics such as accuracy, precision, recall, F1-score, and confusion matrix. These metrics provide insights into the model's performance in distinguishing between real and fake news. Optionally, the model can be fine-tuned by adjusting the smoothing parameter (alpha) or using TF-IDF features. Finally, for practical use, the trained model can be deployed through a web application using tools like Flask or Streamlit, allowing users to input news content and receive a prediction regarding its authenticity. This methodology provides a complete and efficient pipeline for detecting fake news using Multinomial Naive Bayes.



**5.1 Home Page**
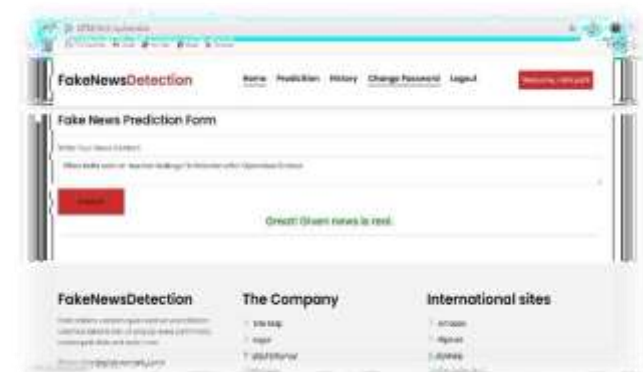


**5.2 News is Real**
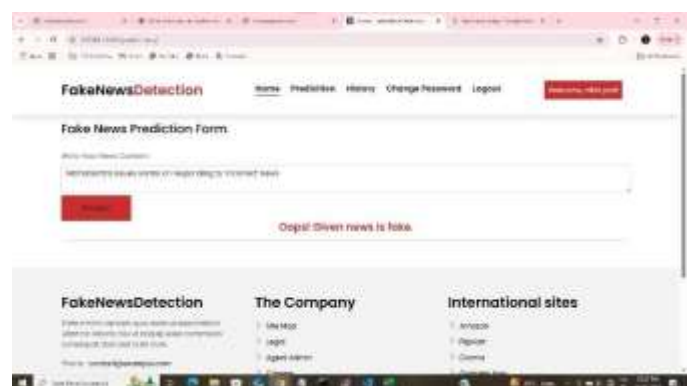


**5.3 News is Fake**

**5.4 History**

## CONCLUSION

In conclusion, with the increasing popularity of social media, more and more people consume news from social media instead of traditional news media. However, social media has also been used to spread fake news, which has strong negative impactson individual users and broader society. In this article, we explored the fake news problem by reviewing existing literature in two phases: characterization and detection. In the characterization phase, we introduced the basic concept sand principles of fake news in both traditional media and social media. In the detection phase, we reviewed existing fake news detection approaches from a data mining perspective,including feature extraction and model.

## REFERENCES

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