

Fake News Detection Using Machine Learning

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Introduction

With the rapid spread of misinformation on the internet, fake news has become a serious threat to society. This project aims to build a machine learning system that can help identify and flag fake news articles based on their textual content. By using natural language processing and classification techniques, we can develop a solution that contributes to digital media integrity.

Abstract

This project utilizes machine learning to classify news articles as either real or fake. The model is trained using labeled datasets consisting of fake and real news articles. TF-IDF is used to convert the text into numerical features, and a Passive Aggressive Classifier is applied to make predictions. The trained model is deployed using a Streamlit web app where users can input news content to get real-time predictions.

Tools Used

- Python
- Pandas
- Scikit-learn
- Joblib
- Streamlit
- Jupyter Notebook / VS Code

Steps Involved in Building the Project

1. Collected two datasets: Fake.csv and True.csv.
2. Labeled and combined both datasets into one: train.csv.
3. Converted text data into numerical features using TF-IDF.

4. Trained Passive Aggressive Classifier on this data.
5. Saved trained model and vectorizer using Joblib.
6. Built a user interface using Streamlit to input news and display predictions.
7. Tested the application using sample real and fake news articles.

Conclusion

This project demonstrates a simple yet effective method to detect fake news using machine learning. While the model provides good accuracy, further improvements can be made by using larger and more diverse datasets, integrating fact-checking APIs, or adopting advanced NLP techniques like transformer models (e.g., BERT). Overall, this project lays the foundation for building trustable AI-driven news verification tools.