আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম
الجامعة الإسلامية العالمية شيتاغونغ
International Islamic University Chittagong

Project Report

Course Code:CSE-3636
Course Title: Artificial Intelligence Lab

Submitted To:

Sara Karim
Adjunct Lecturer

Submitted By:

Name:Sohain Tabassum Biva
ID: C223280
Name:Nusura Nur Nowrin
ID:C223283
Semester:6th
Section:6CF
Department:Department of CSE
Submission Date:09.07.2025

Remarks	

Project Name: Fake News Detection

Introduction:

With the widespread availability of information online, the rapid spread of fake news has become a significant concern. Detecting misinformation is essential to ensure that readers consume reliable information. This project introduces a Fake News Detection powered by machine learning and deployed using Streamlit for easy accessibility. Users can paste any news article into the application and instantly check whether it is real or fake.

Objectives:

1. To develop a model that can classify news articles as Fake or Real.
2. To use machine learning algorithms for text classification.
3. To help users identify misinformation and improve the reliability of news content.

Dataset:

The project uses a publicly available dataset of news articles labeled as Fake (0) and Real (1). This dataset was cleaned and prepared for training and testing the model.

Technology Stack:

Technology	Purpose
Python	Programming language for implementation
Pandas, NumPy	Data preprocessing and manipulation
TF-IDF Vectorsizer	Feature extraction from text
Joblib	Model and vectorsizer serialization for deployment
Streamlit	Web app framework for creating the user interface
Html CSS in streamlit	Styling the app to resemble a newspaper theme
Scikit-learn	Machine learning algorithms and model evaluation

Methodology:

1. Data Preprocessing
    a. Converted text to lowercase, removed punctuation and stopwords.
    b. Applied tokenization and stemming for cleaner input to the model.
2. Feature Engineering
    a. Used TF-IDF Vectorizer to transform news articles into numerical vectors.
3. Model Training
    a. Trained multiple models: Logistic Regression which is chosen for deployment, Random Forest, Gradient Boosting.
    b. Evaluated models using metrics like accuracy, precision, recall, and F1-score.
4. Model Deployment
    a. Serialized the vectorizer and trained Logistic Regression model using joblib
    b. Built an interactive web application with Streamlit where users can check the authenticity of news articles.
5. User Interface Design
    a. Designed a newspaper-themed interface with HTML and CSS injected in Streamlit
    b. Included Check News and Clear Input buttons for better user experience.

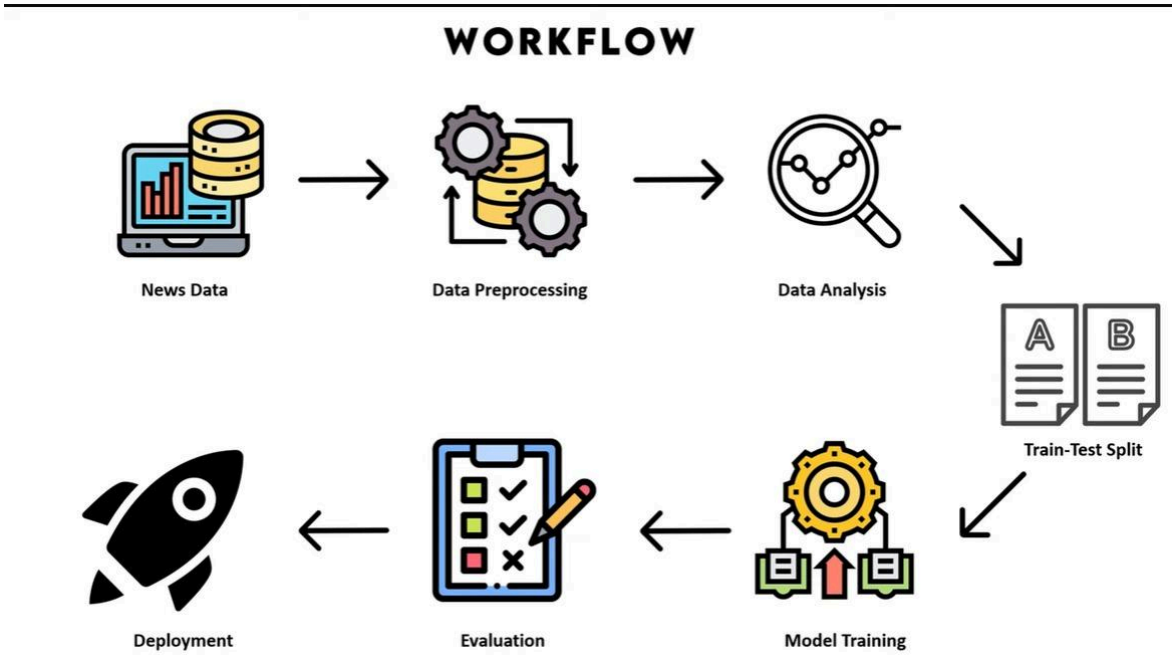

Fig1:Workflow

Flowchart:

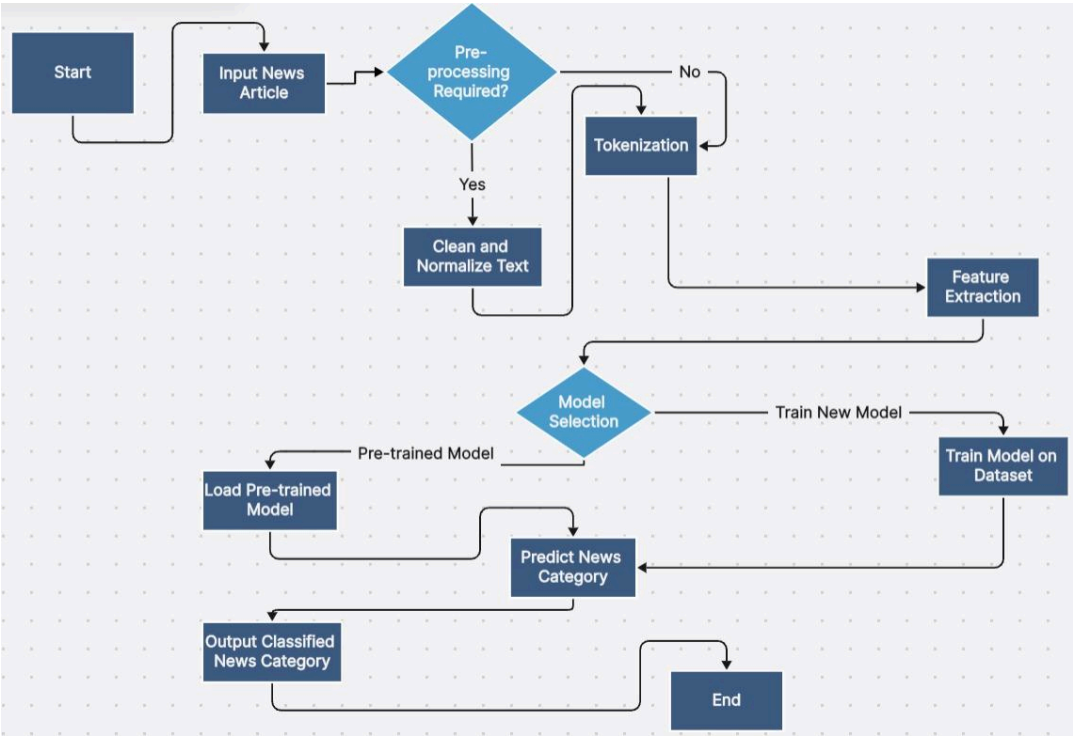

Fig2:Flowchart

Implementation Highlights:

1. Model Accuracy: Achieved ~98.71% accuracy using Logistic Regression.
2. Streamlit App Features:
    a. Text area for user input.
    b. Real-time prediction of news as Real or Fake.
    c. Stylish UI resembling a traditional newspaper.
    d. About section explaining the system and disclaimers

Results:

Model	Accuracy(%)
Logistic Regression	98.71
Random Forest Classifier	98.93
Gradient Boosting Classifier	99.48

Screenshots:

Fig3:Model Accuracy

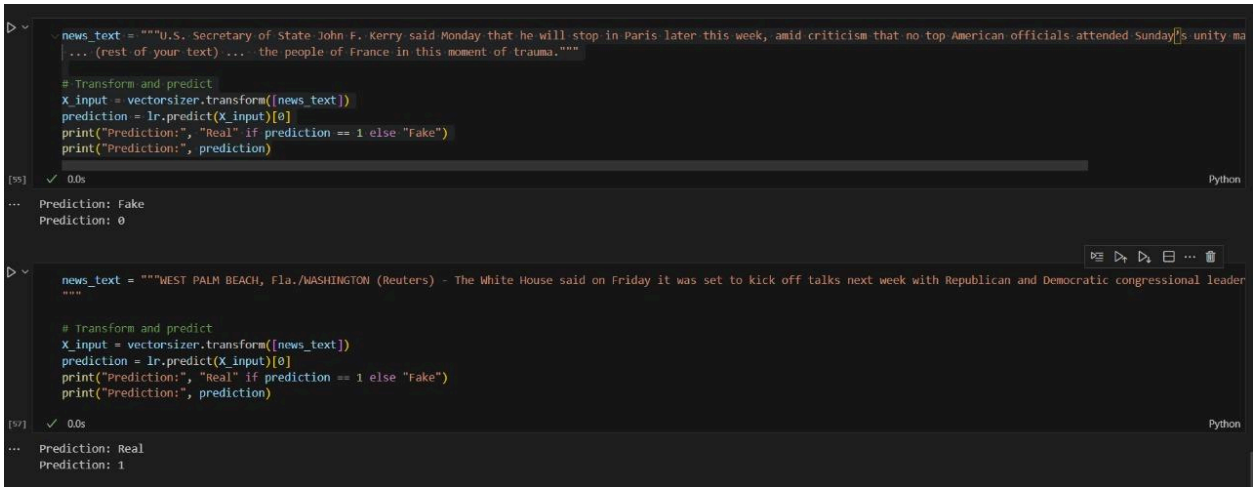

Fig4:Model Result

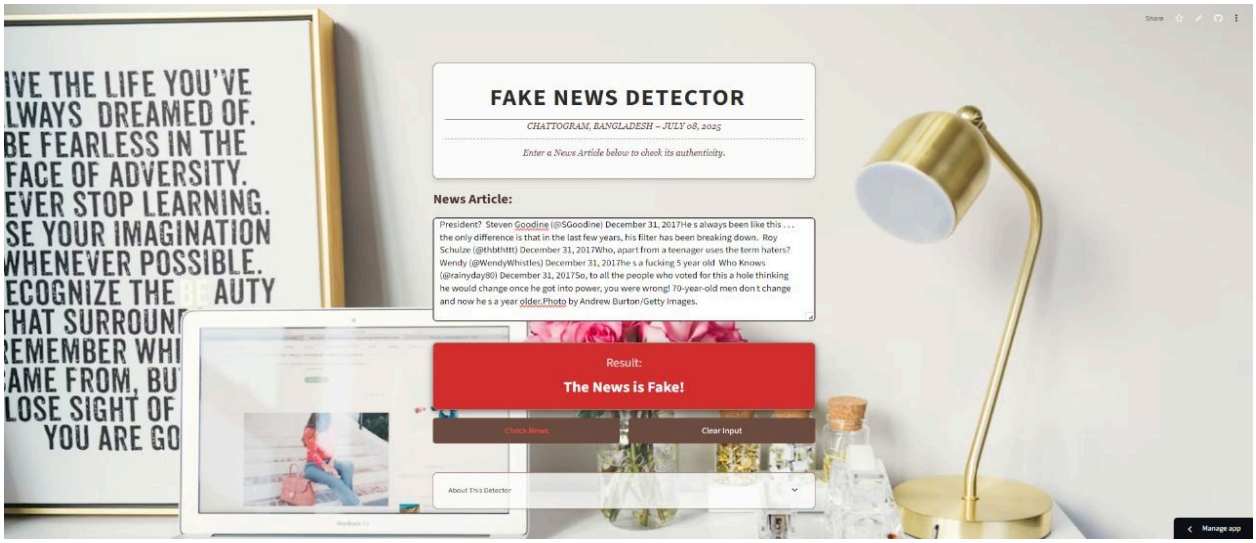

Fig5:News Detection Output 1

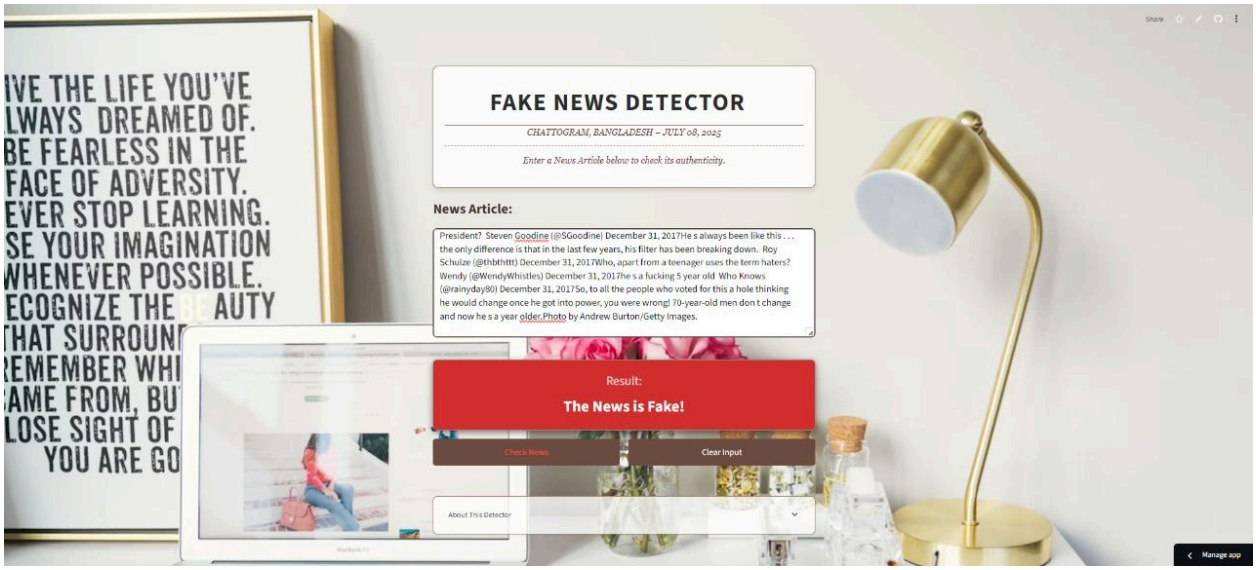

Fig6:News Detection Output 2

Conclusion:

This Fake News Detection system demonstrates how machine learning can help address misinformation by classifying news articles as Fake or Real. By combining NLP techniques and a web-based deployment, the system provides an accessible tool for users to verify news authenticity.

Future Enhancements:

1. Use advanced NLP models such as BERT or GPT-based transformers for improved accuracy.
2. Integrate a browser extension for live fake news detection.
3. Extend the dataset to include multiple languages and sources.