VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI 590018

Project Report on

"FAKE NEWS DETECTOR"

By

MANTRI RAMITHA (1BM24CS165)   MAITHRI V(1BM24CS159)

JAYASHEELA (1BM25CS460)   JANANI (1BM25CS458)

Under the Guidance of

MONISHA H M
Assistant Professor, Department of CSE
BMS College of Engineering

Work carried out at

Department of Computer Science and Engineering
BMS College of Engineering
(Autonomous college under VTU)
P.O. Box No.: 1908, Bull Temple Road, Bangalore-560 019
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BMS COLLEGE OF ENGINEERING DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the OOPS with JAVA project titled **"FAKE NEWS DETECTOR"** has been carried out by MANTRI RAMITHA (1BM24CS165), MAITHRI V(1BM24CS159), JAYASHEELA (1BM25CS46), JANANI HIREMATH(1BM25CS458) during the academic year 2025-2026.

Signature of the guide
MONISHA H M
Assistant Professor,
Department of Computer Science and Engineering
BMS College of Engineering, Bangalore

BMS COLLEGE OF ENGINEERING DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

We, Mantri Ramitha (1BM24CS165), Maitri v (1BM24CS159), Jayasheela (1BM25CS460), Janani Hiremath (1BM25CS458), students of 3rd Semester, B.E, Department of Computer Science and Engineering, BMS College of Engineering, Bangalore, hereby declare that, this project work entitled "FAKE NEWS DETECTOR" has been carried out by us under the guidance of MONISHA H M, Assistant Professor, Department of CSE, BMS College of Engineering, Bangalore during the academic semester Sep-Dec 2025. We also declare that to the best of our knowledge and belief, the project reported here is not from part of any other report by any other students.

Signature of the Candidates

MANTRI RAMITHA (1BM24CS165)
MAITHRI V (1BM24CS159)
JAYASHEELA (1BM25CS460)
JANANI HIREMATH (1BM25CS458)

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Fake News Detector: Intelligent News Verification System

Problem Definition

To develop a software-based application that detects fake news using machine learning and natural language processing techniques. The system should:

* Accept news text or article content from users through a graphical interface

* Process the input text considering:

* Removal of stop words and irrelevant symbols

* Text normalization and tokenization

* Feature extraction using suitable techniques (TF-IDF / Bag of Words)

* Analyze the processed data using a trained classification model

* Classify the news as Fake or Real

* Display the detection result clearly in a user-friendly GUI

* Handle missing, invalid, or unsupported input data gracefully

Objectives

To accurately detect fake news using text classification techniques.

To demonstrate object-oriented programming and machine learning concepts.

To design an intuitive and interactive graphical user interface.

To create awareness about misinformation and digital media literacy.

To provide educational value in understanding natural language processing systems.

Introduction

What is Fake News?

Fake news refers to false, misleading, or deliberately fabricated information that is presented in the form of legitimate news. It is often created to influence public opinion, gain financial profit, spread propaganda, or create confusion among people. With the rapid growth of digital media, social networking platforms, and online news portals, fake news can spread very quickly, reaching a large audience in a short period of time. This makes it difficult for users to distinguish between trustworthy and unreliable information.

Fake News Detection

Fake news detection is the process of identifying and classifying news content as real or fake using computational techniques. In modern systems, this task is performed using machine learning and natural language processing (NLP) methods. These techniques analyze the textual content of news articles by examining word patterns, sentence structure, and linguistic features. By learning from previously labeled news data, the system can predict the authenticity of new and unseen news articles with reasonable accuracy.

Text Analysis in Digital Systems

In digital fake news detection systems, textual data is processed through multiple stages:

* Data Cleaning: Removal of stop words, punctuation, and irrelevant symbols

* Tokenization: Splitting text into meaningful words or tokens

* Normalization: Converting text into a standard format (lowercase, stemming, or lemmatization)

* Feature Representation: Converting text into numerical form using techniques such as Bag of Words or TF-IDF

These numerical features are then used by classification algorithms to detect whether the news is genuine or fake.

Project Significance

This project helps address the growing problem of misinformation in digital media by providing an automated solution for news verification. It serves as:

o An awareness tool to educate users about fake news

o A practical application of machine learning and NLP concepts

o A foundation for building advanced misinformation detection systems

o A demonstration of object-oriented programming and real-world software development skills

System Architecture: From Input to Insight

The system processes news text through a structured pipeline, combining pre-processing, intelligent classification, and clear output

Input Layer

Users submit news text directly via the intuitive GUI for analysis.

Pre-processing

Raw text undergoes cleaning and linguistic analysis to extract key markers for classification.

Classifier Engine
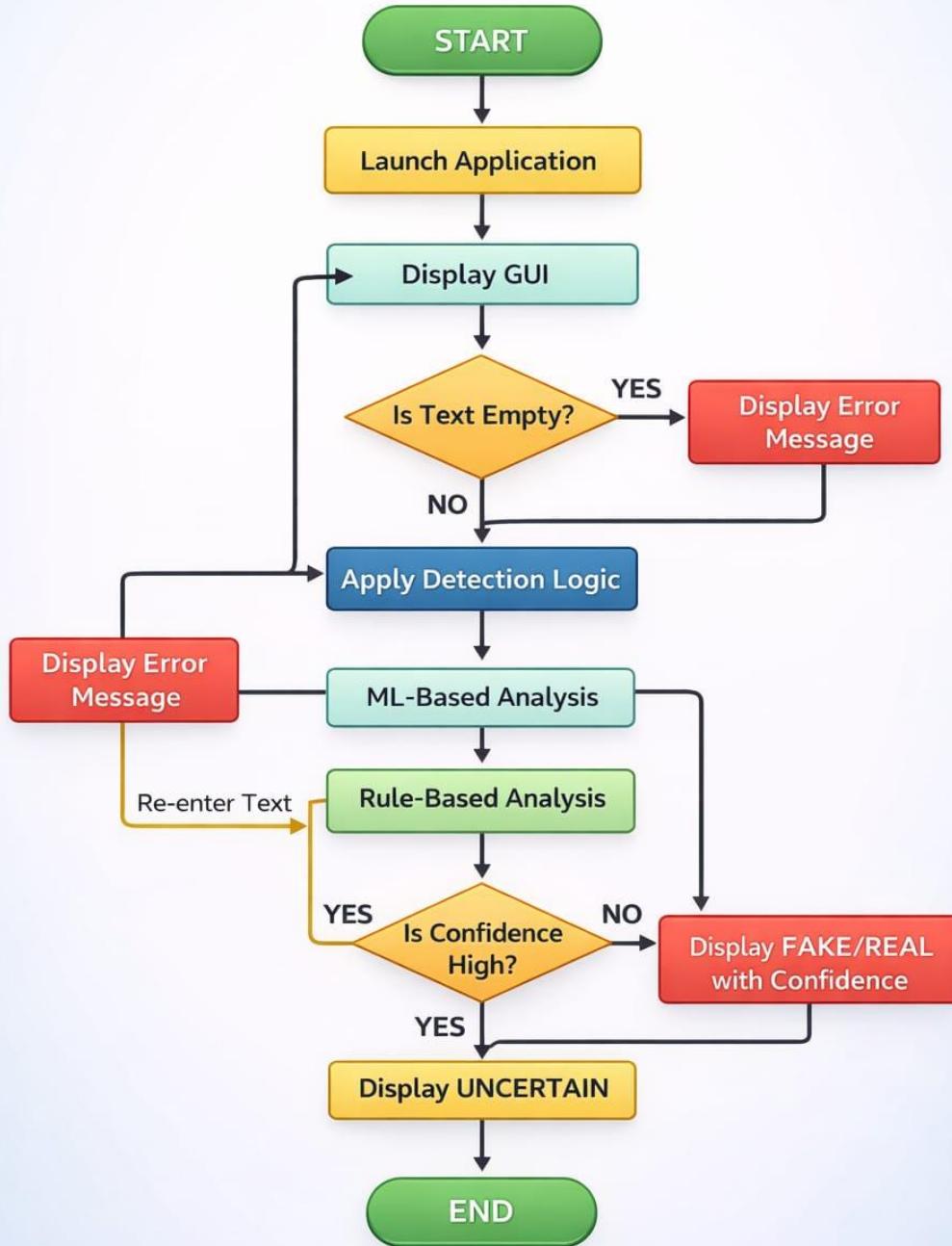
Rule-Based: Checks for terms like "official sources" or "statement released.

ML Model: Computes probability of "Fake" based on sensationalist language (e.g., "shocking secrets")

Output Layer

Presents a clear prediction (REAL, FAKE, UNCERTAIN) along with a confidence percentage

Fake News Detection System Flowchart

START

Launch Application

Display GUI

Is Text Empty? — YES → Display Error Message

NO

Apply Detection Logic

Display Error Message — ML-Based Analysis

Re-enter Text → Rule-Based Analysis

Is Confidence High? — YES / NO → Display FAKE/REAL with Confidence

YES

Display UNCERTAIN

END

Legend:
- Decision
- YES
- NO
- Process
- ML Analysis
- Process
- Rule-based
- Analysis

Tools Used

Programming Languages and Frameworks

Java SE 17+: Core programming language

JavaFX 25.0.1: Graphical User Interface

Java Collections Framework: Data handling

Development Environment

IDE: IntelliJ IDEA / Eclipse / VS Code

Build Tool: Java Compiler (javac)

Version Control: Git (optional)

Libraries

JavaFX SDK

Machine Learning model (pre-trained)

Java Runtime Environment

OOPS Concept used and its Explanation

Abstraction

Concept: Hides implementation details

Implementation: NewsAnalyzer interface defines detection methods

Benefit: Supports multiple detection techniques

Encapsulation

Concept: Bundles data and methods

Implementation:

▪ Private variables for model and data

▪ Public methods for analysis

Benefit: Data security and integrity

Inheritance

Concept: Reuse existing code

Implementation: FakeNewsDetector extends NewsAnalyzer

Benefit: Code reusability

Polymorphism

Concept: One interface, multiple behaviors

Implementation: Method overriding for analysis logic

Benefit: Flexible system design

Exception Handling

```
public FakeNewsClassifier() throws Exception {
```

Concept: Handles runtime errors

Implementation: Custom exceptions for invalid input

Benefit: Robust and stable application

Implementation

News Analyzer Interface

Purpose: Defines methods for news verification

Design Pattern: Strategy Pattern

Text Preprocessor Class

Functions:

* Stop word removal

* Tokenization

* Normalization

Feature Extractor Class

Techniques Used:

* Bag of Words

* TF-IDF

Fake News Detector Class

Algorithm Logic:
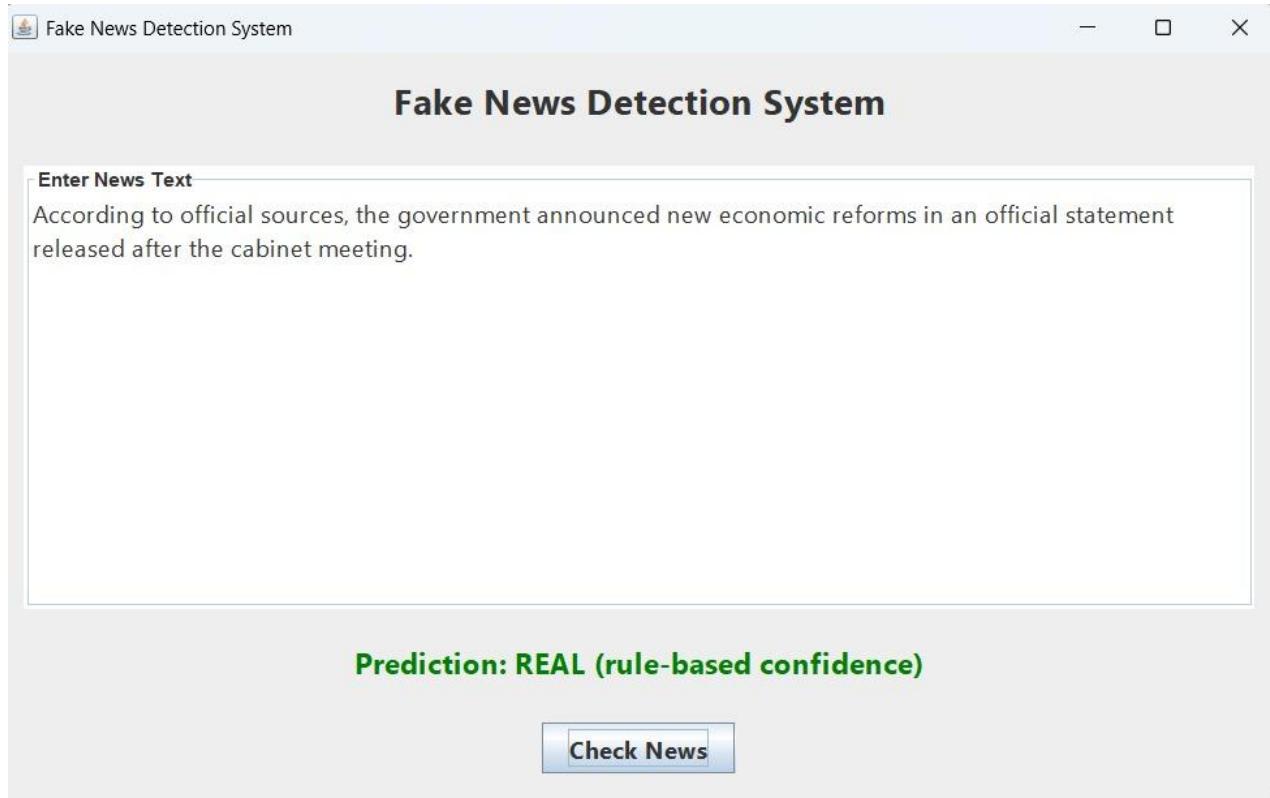
* Input text analysis

* Pattern detection

* Classification using ML model
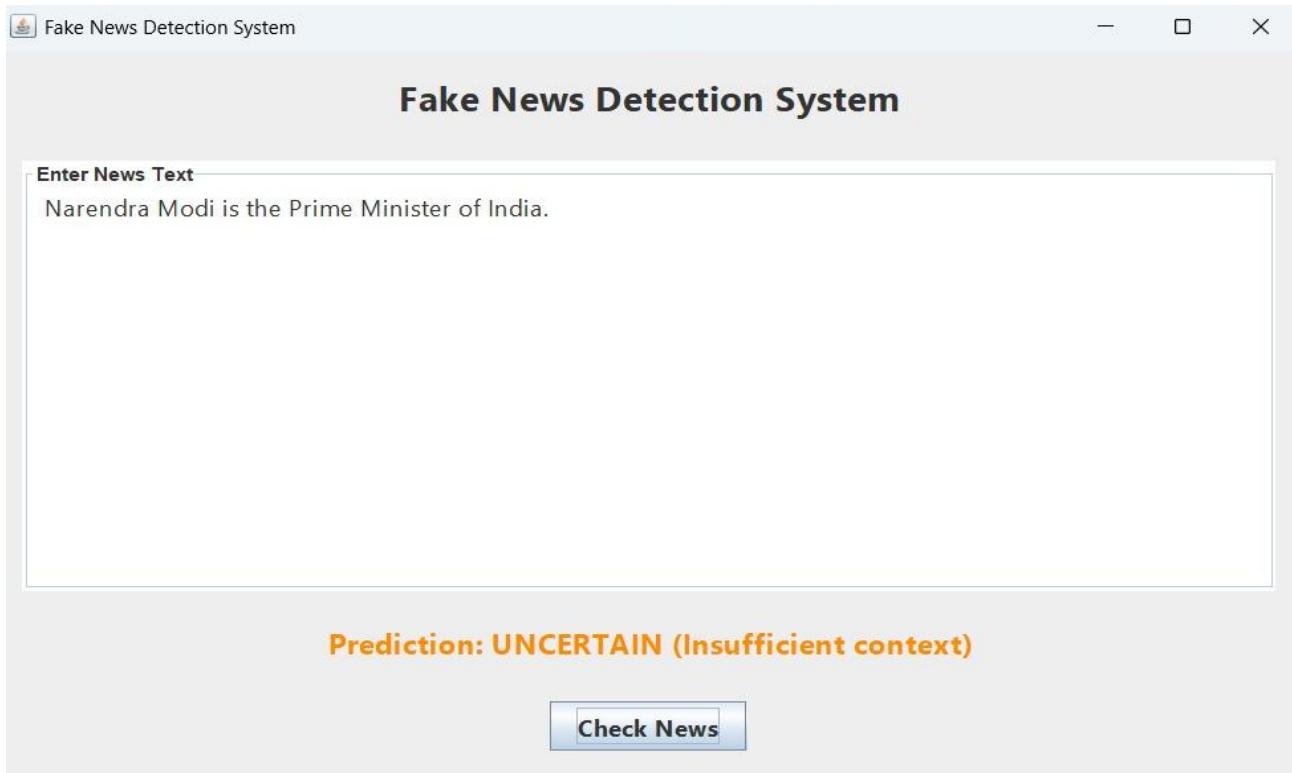
Fake News FX Class

Purpose:

* GUI implementation

RESULT

Fake News Detection System

Enter News Text

According to official sources, the government announced new economic reforms in an official statement released after the cabinet meeting.

Prediction: REAL (rule-based confidence)

Check News

Fake News Detection System

Fake News Detection System

Enter News Text

Narendra Modi is the Prime Minister of India.

Prediction: UNCERTAIN (Insufficient context)

Check News

Fake News Detection System

Enter News Text

Breaking news reveals shocking secrets that authorities tried to hide from the public without any official confirmation.

Prediction: FAKE (68.19% ML confidence)

Check News

Conclusion

Project Achievements

Successfully developed a Fake News Detection System

Applied Java OOP principles effectively

Integrated ML concepts for real-world problem solving

Designed an interactive GUI

Technical Strengths

Modular and scalable design

User-friendly interface

Efficient text processing

Reliable classification results

Current Limitations

Supports only text-based news

Limited dataset size

No multilingual support

Future Enhancements

Support for multiple languages

Integration with online news APIs

Advanced deep learning models

REFERENCES

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https://docs.oracle.com/en/java/

JavaFX Documentation

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Technical Resources

Scikit-learn Documentation

https://scikit-learn.org/stable/documentation.html

Natural Language Toolkit (NLTK) Documentation

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