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Automated Content Verification Using Machine Learning Models

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Abstract: *The rapid spread of false and misleading information across the Internet, social media, and online news platforms has become a major challenge in the digital era. Such misinformation influences public opinion, disrupts social harmony, and undermines trust in media. This study proposes an automated content verification system using machine learning (ML) models to classify online content as real or fake. The research integrates Natural Language Processing (NLP) techniques, supervised learning algorithms, and feature engineering methods. Multiple ML models are implemented and evaluated to compare their effectiveness. Experimental results show that the Support Vector Machine (SVM) model achieved the highest accuracy among the tested models. The proposed framework demonstrates the potential of ML-based systems to support large-scale fact-checking and curb the spread of misinformation in digital media.*

Keywords: Machine Learning, Automated Content Verification, Fake News Detection, Natural Language Processing, Text Classification, Misinformation

I. INTRODUCTION

In the digital age, information is produced and disseminated at an unprecedented scale through social media platforms, online news portals, and messaging applications. While this has improved access to information, it has also facilitated the rapid spread of misinformation and fake news. Unverified and misleading content can manipulate public sentiment, create social unrest, and influence political and social processes.

Traditional fact-checking methods rely heavily on human experts and manual verification, which are time-consuming and not scalable to the massive volume of online content. Consequently, there is a growing need for automated systems that can assist in verifying the authenticity of digital content. Machine Learning (ML), combined with Natural Language Processing (NLP), offers powerful techniques to automatically analyze large volumes of textual data and identify patterns associated with misinformation. This study explores the design and evaluation of ML-based models for automated content verification.

II. PROBLEM DEFINITION

Automated content verification systems aim to:
Distinguish between real and fake content.
Assess the reliability and credibility of online information.
Automate the classification process to handle large-scale data efficiently.

Objective:
The primary objective of this research is to develop and evaluate machine learning models capable of accurately classifying online news articles as real or fake based on textual features.

III. LITERATURE REVIEW

Previous studies have demonstrated the effectiveness of ML and NLP techniques in fake news detection and content verification. Researchers have explored various feature extraction methods such as Bag-of-Words, TF-IDF, and word

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embeddings (Word2Vec, GloVe). Traditional classifiers including Logistic Regression, Support Vector Machines (SVM), Naïve Bayes, and Random Forest have shown strong baseline performance in text classification tasks.

Recent advancements have focused on deep learning approaches such as Long Short-Term Memory (LSTM) networks and transformer-based models like BERT, which capture contextual and semantic information more effectively. Surveys in this domain highlight that hybrid approaches combining linguistic features with user behavior and source credibility can further improve detection accuracy. However, deep learning models require large datasets and computational resources, making classical ML models still relevant for practical deployments.

IV. RESEARCH METHODOLOGY

4.1 Data Collection

The dataset was compiled from online news portals and social media sources. The data consisted of two labeled classes:

Real news

Fake news

A total of over 15,000 labeled news articles were used for training and evaluation.

4.2 Data Preprocessing

The raw text data was cleaned and preprocessed using the following steps:

Tokenization

Removal of stop words

Lemmatization

Removal of punctuation and special characters

4.3 Feature Engineering

Textual features were extracted using:

TF-IDF (Term Frequency–Inverse Document Frequency)

Word embeddings (Word2Vec)

These representations transformed text into numerical vectors suitable for ML models.

4.4 Machine Learning Models

The following supervised ML models were implemented and evaluated:

Model	Accuracy
Logistic Regression	83%
Support Vector Machine (SVM)	**89%**
Random Forest	86%
Multi-Layer Perceptron (MLP)	87%

Among these, SVM achieved the highest classification accuracy.

V. RESULTS AND DISCUSSION

The experimental results indicate that ML-based automated content verification systems can effectively distinguish between real and fake news. Proper preprocessing and feature engineering significantly improved model performance. The SVM model performed best due to its ability to handle high-dimensional text data and find optimal decision boundaries.

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However, some misclassifications occurred due to ambiguous language, sarcasm, and context-dependent information. This highlights the limitations of purely text-based approaches and the need to incorporate additional contextual signals such as source credibility and propagation patterns.

VI. LIMITATIONS

Performance may vary across different languages and domains.
Limited availability of large, high-quality labeled datasets.
Text-only models struggle to capture sarcasm, irony, and multimedia misinformation (images/videos).

VII. FUTURE WORK

Future research directions include:
Integrating deep learning models such as BERT and transformer-based architectures.
Developing multilingual content verification systems.
Incorporating multimodal data (text, images, videos).
Building real-time content verification tools for social media platforms.

VIII. CONCLUSION

This study demonstrates that machine learning-based automated content verification systems can effectively identify misinformation in online content. By combining NLP techniques with supervised ML models, the proposed framework achieves high accuracy in classifying real and fake news. Such systems can play a crucial role in supporting large-scale fact-checking, promoting trustworthy information, and mitigating the societal impact of misinformation in the digital ecosystem.

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