Ai Powered Multi-Model Fake News Detection System

integrating deep learning and fact-checking for real-time detection

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***Abstract*— This paper presents an AI-powered multi-model fake news detection system that leverages deep learning for visual content analysis and the Gemini API for robust text prediction. The system processes news articles, images, and videos in real time, using state-of-the-art natural language processing and convolutional neural networks to classify content as real or fake. By integrating a fact-checking API and storing results in a MySQL database, the system ensures secure and scalable data management. Experimental results demonstrate high accuracy across all modalities, providing a comprehensive tool to combat the spread of misinformation.**

***Index Terms*— Fake News, Deep Learning, Gemini API, NLP, Multi-Modal Analysis, Real-Time Detection.**

I. INTRODUCTION

The proliferation of digital media has led to an unprecedented spread of misinformation, making fake news detection a critical challenge in today's society. Traditional fact-checking methods are manual and inefficient, unable to keep pace with the rapid flow of information. This project proposes an AI-powered solution that addresses these limitations by combining deep learning techniques for image and video analysis with the advanced text prediction capabilities of the Gemini API. The system is designed to automatically and accurately distinguish between genuine and misleading content, thereby supporting informed decision-making and maintaining public trust in digital platforms. The paper outlines the system's architecture, detailing how multi-modal analysis and secure data management are integrated to provide a scalable solution.

II. METHODOLOGY

The system comprises three core modules: text analysis, visual content analysis, and database management. For text analysis, the Gemini API is employed to evaluate news headlines and provide a "Real" or "Fake" classification along with a confidence score. The text is preprocessed using NLP techniques to standardize inputs before submission. In parallel, a CNN-based deepfake detection model is applied to images and video frames, which are first resized and normalized. Video analysis is performed by sampling frames at regular intervals, averaging the predictions to form a final decision. All results are securely stored in a MySQL database, enabling historical tracking and future performance analysis. FastAPI serves as the backend framework, ensuring that the system can handle multiple API calls concurrently and deliver real-time responses to the user interface..

III. RESULTS AND DISCUSSION

Experimental evaluation shows that the system achieves high accuracy in detecting fake news. The Gemini API effectively identifies deceptive text with confidence scores typically exceeding 90%, while the deepfake detection model reliably distinguishes manipulated images and videos. Combining these modalities reduces the overall error rate and enhances robustness. Some challenges were encountered in handling ambiguous language and low-quality media, which will be addressed in future work. The system's real-time processing and secure data storage demonstrate its potential for practical deployment in dynamic digital environments.

IV. CONCLUSION AND FUTURE SCOPE

In conclusion, the AI-powered multi-model fake news detection system successfully harnesses the capabilities of deep learning and the Gemini API to combat misinformation. Future improvements will focus on expanding language support, refining model accuracy with additional datasets, and integrating real-time social media monitoring to further reduce the spread of fake news.

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