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AI-POWERED JOB PORTAL FRAMEWORK FOR REAL-TIME DETECTION OF FRAUDULENT JOB POSTINGS USING NLP AND MACHINE LEARNING

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ABSTRACT

The rapid growth of social media platforms and online job portals has made job searching easier for students and professionals. However, this convenience has also led to a significant increase in fake job postings and recruitment scams that mislead job seekers with false promises of high salaries, easy hiring, or fake company information. Such fraudulent activities often result in financial loss, misuse of personal data, and emotional stress. Existing job platforms mainly focus on providing job listings and offer limited support for verifying the authenticity of job advertisements. To address these challenges, this project introduces an **AI-Based Fake Job Detection System**, a web-based application that automatically analyses and verifies job postings using Machine Learning and Natural Language Processing techniques. The system allows users to input or paste job descriptions, which are then processed through text preprocessing steps such as tokenization and TF-IDF vectorization. A trained Logistic Regression classifier evaluates the extracted features and predicts whether the job is genuine or fraudulent with a confidence score.

The system is designed with a simple and user-friendly interface to ensure accessibility for users with varying technical skills. It follows a modular architecture comprising user registration, job input, job verification, result and alert generation, report history, and administrative management modules. These modules work together to provide secure access,

efficient processing, and reliable results. The proposed system effectively reduces online job fraud, improves user awareness, and enhances trust in digital recruitment platforms. It demonstrates strong potential for real-world deployment and can be further extended with mobile application support, advanced deep learning models, and integration with multiple job portals for large-scale fraud detection.

KEYWORDS: Internet of Things, Machine Learning, Natural Language Processing, Artificial Intelligence.

1. INTRODUCTION

An AI-Based Fake Job Detection System is a web-based software application designed to automatically identify fraudulent job postings on social media platforms and online job portals. With the rapid growth of digital recruitment, job seekers increasingly rely on online sources to find employment opportunities. However, this has also led to a rise in fake job advertisements that mislead users with false salary offers, fake company information, and fraudulent registration fees. Manual verification of such postings is difficult, time-consuming, and often unreliable [1].

The proposed system uses Machine Learning and Natural Language Processing techniques to analyze job descriptions and determine whether a job posting is genuine or fake. The input data, which includes job descriptions and related information, is processed through text preprocessing steps such as tokenization, stop-word removal, and TF-IDF vectorization to convert textual content into numerical features. These features are then evaluated using a trained classification algorithm to generate accurate predictions [2].

Once the verification process is completed, the system presents the result to the user in a simple and user-friendly interface. Users can view whether the job is real or fake along with a confidence score, helping them make informed decisions. The system also stores previously checked job details for future reference and allows administrators to manage datasets, monitor system performance, and update the machine learning model [3].

Security measures are implemented to protect user data and ensure safe access through authentication and authorization mechanisms. The web-based design ensures accessibility across different devices and browsers, providing convenience and reliability for all users. By offering automatic job verification, the proposed system reduces online job fraud, saves time, and enhances trust in digital recruitment platforms [4].

2. LITERATURE SURVEY

Currently, most job seekers rely on online job portals and social media platforms to search for employment opportunities. These platforms allow companies and recruiters to post job advertisements, but they provide limited mechanisms to verify the authenticity of those postings. As a result, many fake job offers are published, which mislead users with false promises such as high salaries, easy hiring processes, or fake registration fees [5].

Traditionally, users manually verify job authenticity by checking company details, searching online reviews, or contacting recruiters. This manual verification process is time-consuming, unreliable, and prone to human error. Some websites provide basic filtering or reporting features, but they lack intelligent systems to automatically detect fraudulent job postings [6].

Manual or basic verification methods do not use advanced Machine Learning or Natural Language Processing techniques to analyze job content. Therefore, fake jobs often go undetected, leading to financial loss, misuse of personal information, and emotional stress for job seekers. Hence, the existing system lacks automation, accuracy, and real-time fraud detection capabilities [7]. The increasing number of fake job postings creates serious challenges for job seekers. Identifying whether a job is real or fake manually is difficult and requires significant time and effort. Many users are unaware of fraud indicators, which makes them vulnerable to scams.

There is no efficient automated system available to instantly verify job authenticity. Without a proper detection mechanism, users may share sensitive information or pay money to fraudulent recruiters. Therefore, a smart and automated solution is required to analyze job descriptions and detect fake postings accurately. The proposed AI-Based Fake Job Detection System helps overcome these problems by automatically verifying job advertisements using Machine Learning and NLP techniques. It reduces manual effort, improves accuracy, and provides safe and reliable job verification for users.

3. PROPOSED METHODOLOGY

The proposed system is an AI-Based Fake Job Detection System developed as a web-based application to automatically identify fraudulent job postings. The system uses Machine Learning and Natural Language Processing techniques to analyze job descriptions and classify them as real or fake. It helps users verify job authenticity instantly without performing manual checks, thereby saving time and reducing effort.

The proposed system allows users to securely register and log in, enter or paste job descriptions, and receive immediate verification results. The job data is processed using text preprocessing techniques such as tokenization and stop-word removal, and then converted into numerical features using TF-IDF vectorization. A trained Logistic Regression classifier predicts whether the job posting is genuine or fraudulent and displays the result along with a confidence score.

This system provides a simple and user-friendly interface so that users with basic technical knowledge can easily operate it. It also maintains report history for previously verified jobs and includes an admin module to manage datasets, monitor users, and update the machine learning model. All tools and technologies used, such as Python, Flask, and Scikit-learn, are open source and cost-effective, making the system economical and easy to develop.

The web-based design ensures accessibility across different devices and browsers, providing reliable and secure job verification services. By automating the detection process, the proposed system improves accuracy, enhances user safety, reduces online job fraud, and overcomes the limitations of the existing manual verification methods.

3.1 AI-Based Fake Job Detection System

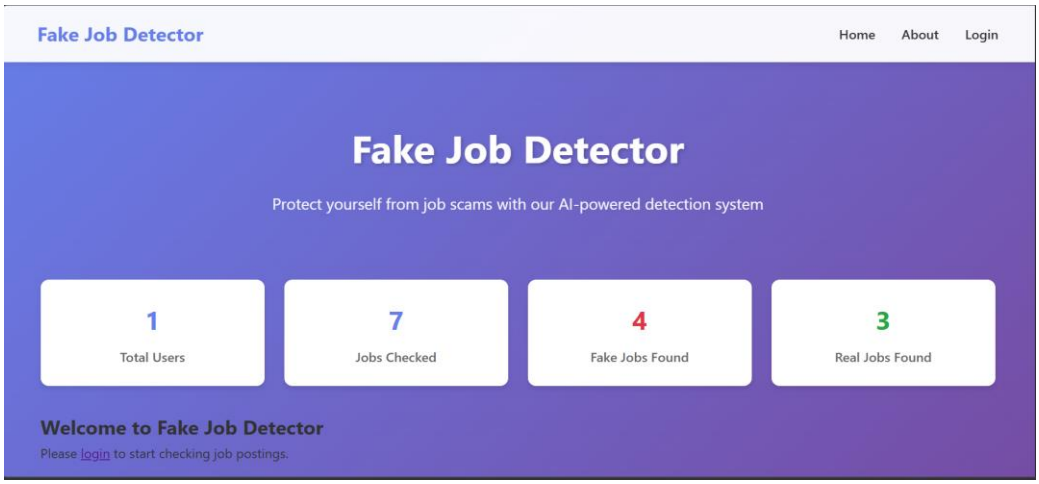

Fig 1: Fake Job Detector System.

The **AI-Based Fake Job Detection System** consists of six comprehensive components designed to help users verify the authenticity of job postings and avoid online recruitment scams. Each components performs a specific function to ensure smooth operation, accurate detection, and secure access to the system.

3.1.1 USER REGISTRATION & LOGIN

The User Registration and Login handles the account creation and authentication process of users. New users can register by providing their basic details such as username, email, and password. Existing users can log in using their credentials to access the system securely. This module ensures that only authorized users can use the job verification features. All user information is safely stored in the database for future access.

3.1.2 JOB INPUT

The Job Input allows users to enter or paste the job description and related details for verification. Users can submit job information collected from social media or job portals. The system validates the input to ensure correct and complete data before processing. This module acts as the primary interface between the user and the verification system. The entered data is temporarily stored for analysis.

3.1.3 JOB VERIFICATION

The Job Verification is the core component of the system. It processes the submitted job description using Natural Language Processing techniques such as tokenization and TF-IDF. The processed data is converted into numerical form and analyzed using a Machine Learning algorithm. The Logistic Regression classifier predicts whether the job is real or fake. This module ensures accurate and automatic fraud detection.

3.1.4 RESULT & ALERT

The Result and Alert displays the verification outcome to the user. It shows whether the job posting is genuine or fraudulent along with a confidence score. If the job is detected as fake, warning messages are provided to alert the user. This module helps users make safe and informed decisions. The results are presented in a simple and user-friendly format.

3.1.5 ADMIN MANAGEMENT

The Admin Management allows the administrator to monitor and control the entire system. The admin can manage users, update datasets, and retrain the machine learning model for better accuracy. This module also monitors verification activities and system performance. It ensures smooth functioning, data security, and overall system maintenance.

The prediction result and history of fake job detection system are shown below in the fig 2 and fig 3.

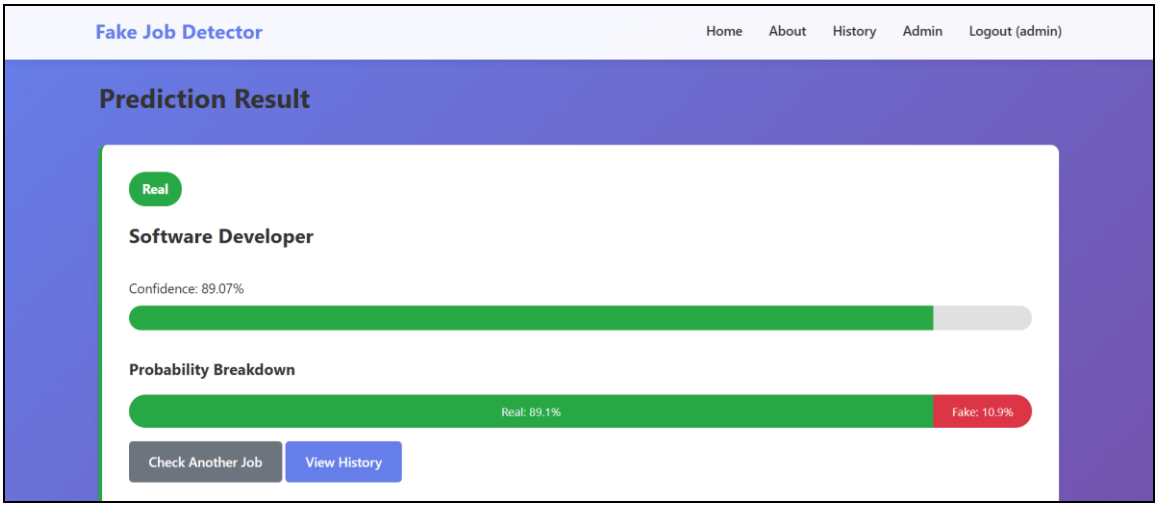

Fig 2: Prediction Result.

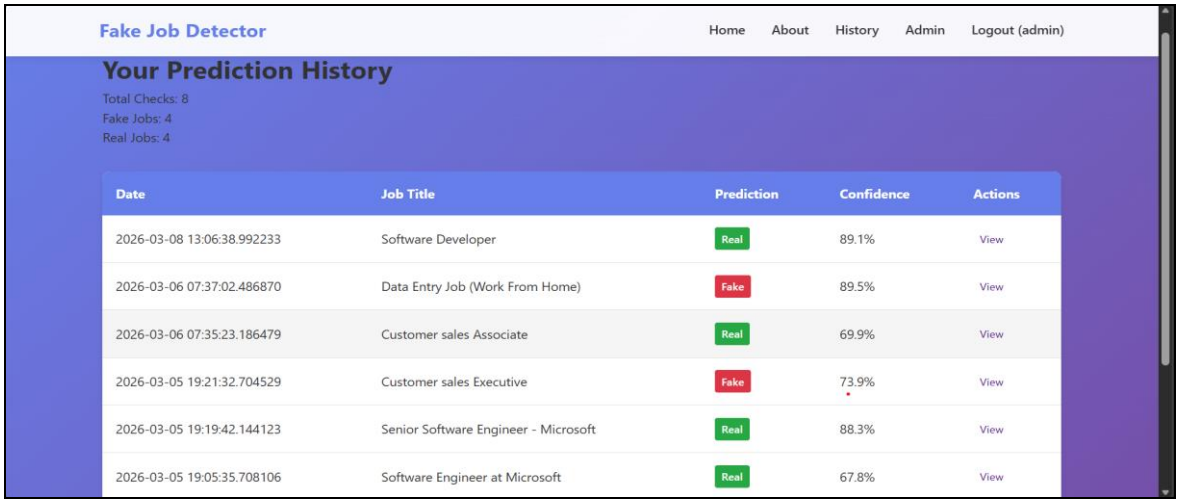

Fig 3: Fake Job Detector.

4. CONCLUSION

The AI-Based Fake Job Detection System is a user-friendly web application that helps identify fraudulent job postings using Machine Learning and Natural Language Processing techniques. The system allows users to enter job descriptions and instantly verify whether the job is genuine or fake, thereby protecting job seekers from scams and financial loss. By integrating Python Flask, TF-IDF feature extraction, and a trained classification model, the application provides fast, accurate, and reliable predictions. Overall, the system improves trust in online job portals and offers a secure and intelligent solution for safe job searching. The Fake Job Detection System can be further enhanced by developing mobile applications for Android and iOS to provide easier access for users. Advanced Machine Learning and Deep Learning algorithms can be integrated to improve detection accuracy and handle large datasets. Real-time job link scanning and automatic fraud alerts can be added to detect

suspicious postings instantly. Cloud deployment and API integration with job portals can improve scalability and performance. Additional features such as multilingual support, user feedback mechanisms, and admin analytics dashboards can further enhance usability and system efficiency.

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