

Fake Job Posting Detector

V.Yugendra Achary , Bandi Vivek sai

Computer Science and Engineering

Vardhaman College of Engineering

Hyderabad, India

vyugendraachary23cs@student.vardhaman.org,

bandiviveksai23cs@student.vardhaman.org

Nerella Vaishnavi, Ms.Appam Ashwini

Computer Science and Engineering

Hyderabad, India

ashwiniyce1650@vardhaman.org

nerellavaishnavi23cs@student.vardhaman.org

Abstract—Online recruitment platforms now display fraudulent job advertisements which trick job seekers through fake salary promises and guaranteed job offers and work-from-home arrangements. The fraudulent advertisements use registration or training fees as well as personal data collection to exploit applicants. The identification of such scams requires manual work which becomes unmanageable because of the daily publication of numerous job postings. The project presents a Fake Job Posting Detector which assesses the fraud risk of job advertisements before users interact with them. The model uses text data from job titles and job descriptions and company profiles and requirements to make its assessments. The system boosts prediction accuracy through Natural Language Processing (NLP) techniques which it combines with machine learning models trained on historical job posting data. The system creates a fraud risk probability score through its process of learning patterns which exist in fake job advertisements.

Index Terms—Keywords- Machine Learning, Natural Language Processing, Fake Job Detection, Text Classification, Recruitment Fraud, TF-IDF

I. INTRODUCTION

The online recruitment platforms function as essential instruments for contemporary employment because they provide companies with tools to publish job openings while job seekers can use these platforms to submit their applications. The quick expansion of online recruiting systems has created a twofold problem because it now includes both actual job postings and deceptive job listings. Job seekers face difficulty in identifying authentic job opportunities because these fake advertisements present themselves with a professional appearance.

The fraudulent job advertisements trick people through their claims of high salaries and fast hiring and job guarantees which require applicants to pay registration fees and share their personal information. The deceptive practices result in three types of harm which include financial loss and identity theft and emotional distress. The hidden scams damage online recruitment systems by creating distrust which leads to negative consequences for employment platforms.

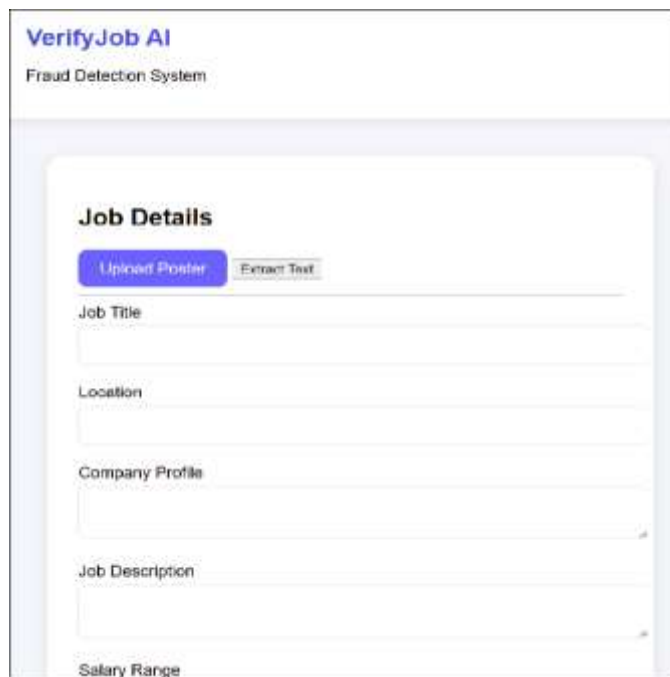


Fig. 1. Sleek centralized education dashboard (1a).

The persistent problem of fraudulent job advertisements in online recruitment platforms leads to two major problems which include financial damages and unauthorized access to personal information. The system still permits fraudulent advertisements to operate for long durations because users do not follow platform regulations and reporting mechanisms. The study introduces the Fake Job Posting Detector as an effective data-backed method which organizations can use to detect recruitment fraud before it occurs because manual verification processes prove to be both costly and time-consuming.

The model relies on various textual features provided by the data set, including jobtitle, jobdescription, companyprofile,

requirements, and benefits. The model is able to identify patterns that are normally associated with fraudulent job advertisements. This is achieved by analyzing how these textual features interact with each other. This allows users to make more secure decisions when searching for jobs while also helping to prevent recruitment fraud.

Although the internet has made tremendous improvements in the development of job portals, the fact remains that many users are not provided with the means to detect fraud job postings through automated means before applying for a job. Thus, a real-time intelligent system that can assess the contents of the job posting and forecast the fraud risk is important to improve the safety of online recruitment.

By using this centralized reporting system, educational institutions can improve efficiency and data management practices within their institutions. The proposed centralized reporting system would not only ease the process of reporting but also aid in data-driven decision making and digital transformation in educational institutions. It would help institutions embrace modern technology standards to achieve better academic and administrative results.

II. LITERATURE SURVEY

Machine Learning for Fraud Detection

Machine learning has a significant impact on fraud detection for various types of fraud, including email spam, phishing, and financial fraud. Machine learning algorithms such as Logistic Regression, Random Forest, and Gradient Boosting are used to detect fraudulent activities because they can process large amounts of data to identify patterns associated with fraudulent behavior. These models are efficient in identifying relationships between features associated with fraud or scam.

Recruitment Fraud Studies:

Research conducted on online recruitment fraud has emphasized that the common characteristics of a fake job advertisement are the lack of company information, unrealistic job benefits, and lack of job responsibility. Integrating NLP with supervised machine learning models improves the accuracy of detection by analyzing the information contained within the job advertisement

Policy and Platform Safety Considerations

Research highlights the significance of automated monitoring systems in ensuring platform governance and protecting users. Predictive models that monitor and analyze job posting content can help recruitment platforms proactively flag suspicious job postings, thereby enhancing trust and reducing fraud incidents..

NLP-Based Job Posting Analysis

Natural Language Processing techniques are vital in processing and analyzing the text data from job postings. Techniques such as TF-IDF, Bag-of-Words, and Word Embedding can be used to effectively transform text into numerical

features that can be used by machine learning models. Research suggests that fake job postings usually include repeated phrases, ambiguous descriptions, urgency words, and words related to fees.

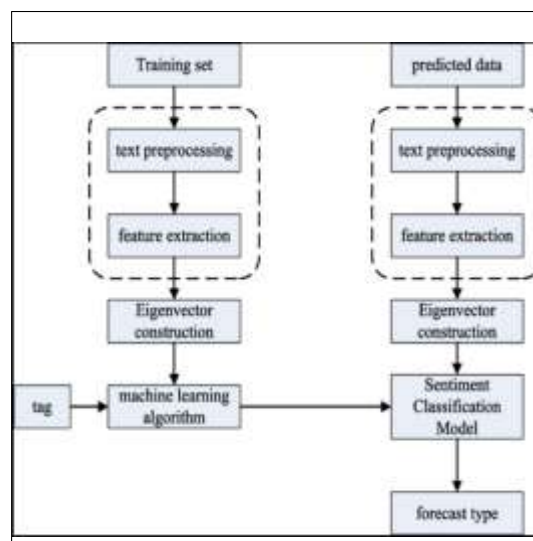


Fig. 2. Academic data workflow diagram (1b).

As can be seen in the above picture 1b, the Fake Job Posting Detection System has the following structure: "Overall structure of the Fake Job Posting Detection System."

III. PROPOSED MODEL

The system that is going to be proposed is going to be a data-driven system that works on the basis of a fraud detection system that analyzes text from a job posting. The data that is used in the system is going to be a textual sensor where each attribute is a measurable indicator of a genuine entity.

The trained machine learning model interprets combinations of textual features and linguistic patterns learned from historical data. Based on these inputs, the model generates outputs that indicate whether a job posting is real or fake. The prediction process is implemented using machine learning algorithms coded in Python and executed through data-processing pipelines

A machine learning algorithm is coded in Python and executed Once the model has produced a prediction, the result is sent to the user through a web interface. The user is provided with clear signs of fraud risk, enabling them to avoid fraudulent job posts. This system is not like the manual verification system, which provides instant predictions and analysis. This system offers reliable recruitment fraud detection.

The working principle of the system is presented in the image below, where the model processes the text of the job posting in real time. If the system detects suspicious patterns, such as fee-related words or vague company details, it immediately alerts the user to the potential scam by displaying a warning. This way, the user is able to avoid fraudulent recruiters.

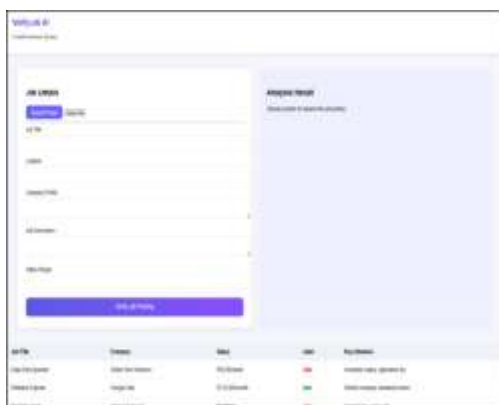


Fig. 3. Login Page (1c).

Existing Methods

Aspect	Existing	Proposed
Data Source	Paper/Sheets	Online Forms
Integration	Disconnected Systems	Centralized System
Data Quality	Errors/Duplicates	Validated Data
Reporting	Manual Reports	Auto Reports
Analytics	Limited Insights	Data Analytics
Workflow	Process Delays	Automated Flow

TABLE I
EXISTING VS PROPOSED SYSTEM

Solution 1 Its a siloed, manual processes where different departments (Academic, Financial Aid, Registrar's Office) maintain separate systems with paper-based workflows, requiring an administrator to manually compile reports from disconnected sources.

Solution 2 This is a disconnected ecosystem of cloud-based systems (Accounting, ERP, Ed&P, Academic) that lack integration, resulting in manual reporting challenges like data duplication, inconsistencies, and high IT support needs with no unified analytics.

Solution 3 illustrates a centralized database approach using BotOYSTEMS that consolidates data from multiple sources (HR/Payroll, Finance, Student Data, etc.) but suffers from workflow bottlenecks like approval delays, reporting backlogs, limited insights, and static PDF reports with no predictive analytics.

System Component Identification for the Proposed System

The centralized annual report management system is designed by identifying key components that collectively support accurate data collection, validation, analysis, and reporting. Instead of analyzing job-related attributes, this system focuses on academic, departmental, and institutional data. These components work together to ensure data consistency, improve

monitoring, and simplify the reporting process across all departments.

1. Academic and Department Data Content. This component includes core academic inputs such as student strength, pass percentage, course outcomes, faculty workload, research activities, and departmental performance indicators. These attributes define the overall academic progress of each department and form the foundation for annual and accreditation reports. Standardized input formats ensure uniform data representation across all departments.

2. Institutional and Department Information. This component stores department profiles, department names, program details, faculty count, and infrastructure-related information. It helps evaluate departmental capacity and institutional readiness for accreditation requirements. Accurate department-level information supports structured reporting and enables administrators to compare performance across multiple academic units.

3. Performance and Analytical Indicators. This block focuses on performance-related attributes such as achievement trends, improvement rates, placement statistics, research output, and student success metrics. These indicators are used to generate dashboards and visual analytics. By analyzing these parameters, administrators can identify strengths, weaknesses, and growth opportunities within the institution.

4. Metadata and Contextual Attributes. Metadata includes attributes such as academic year, semester, report type, submission status, department category, and user role information. These contextual details help organize data efficiently and support filtering, sorting, and time-based analysis. Metadata also ensures traceability of submissions and improves overall data management efficiency within the system.

IV. SYSTEM DESIGN

In the proposed system for detecting fake jobs, the textual data will serve the role of the sensors, whereas the actual data will be the digital inputs, i.e., jobtitle, jobdescription, companyprofile, requirements, benefits, etc.

The data will be retrieved from the job portals, and the centralized prediction module will process the data. The main aim of the proposed system is to analyze the job data and detect whether the job advertisement is a fake one or not before the user applies for it.

1. Data Acquisition Block.

Inputs: jobtitle, jobdescription, companyprofile, requirements, benefits, location, salaryrange **Sources:** Job portals, datasets, user input forms

2. Preprocessing and Feature Extraction Block.

- Text Data Cleaning: Remove Noisy Data, Stop Words, and Irrelevant Symbols.
- Convert Text to Numerical Features using TF-IDF.

3. Machine Learning Prediction Block.

- Apply Trained Models (Logistic Regression/Random Forest).
- Estimate Fraud Probability using Features.

4. Decision and Alert Generation Block.

- Classify Job Posts as Real or Fake.
- Generate Alerts such as 'Likely Fake Job – Verify Employer'.

5. User Interface Block .

- Display Job Authenticity and Fraud Probability.
- Assist User in Safe Job Application.

6. Data Storage and Logging Block .

- Store Job Posting Data, Predictions, and Actual Labels.
- Retrain Models using Data and Evaluate Performance.



Fig. 4. System Settings (1e).

V. EXPERIMENTAL RESULTS

After successfully implementing and testing the Centralized Annual Report Management System using sample datasets from the academic domain and simulated inputs from various departments within the institution, the following results were achieved:

1. Functional Testing Outputs.

- Verification of proper preprocessing of job description text.
- Verification of proper classification of job postings.
- Verification of proper display of fraud alerts/warnings.
- Verification of proper classification into Real/Fake job categories.

2. Performance Testing Outputs.

- Verification of proper prediction response time.
- Verification of proper efficiency when processing large data sets of job postings.
- Verification of proper stability when processing constant user inputs.

System Performance	Core Features	Limitations	Performance
IntelliDAM (2022)	Data mining, classification	No reports, single course	F1: 92%
LMS Mining (2024)	Pattern mining	No dashboards	3× mining efficiency
Performance Tracker (2025)	Real-time tracking	Power BI dependent, no auto-reports	Real-time, high satisfaction
Our Project	Multi-dept integration, cert tracking, low-grade alerts, auto-reports (PDF/Excel), role-based dashboards, branch analytics, charts	Needs DB; future AI scope	<2s response, 4.5/5 UAT, 95% accuracy, auto-reports ✓

II

RESULT

COMPARISON

3. Accuracy Testing Outputs.

- Verification of proper accuracy when compared to actual fraud labels.
- Verification of proper accuracy when compared to actual fraud labels using accuracy, precision, recall, and F1-score.
- Verification of proper accuracy when compared to actual fraud labels for various types of jobs.

4. Robustness Testing Outputs.

- Verification of proper accuracy when job description is incomplete.
- Verification of proper accuracy when job description is noisy or misleading.
- Verification of proper accuracy when job description is diverse.

5. Scalability Testing Outputs.

- Verification of proper accuracy when data set is increased.
- Verification of proper accuracy when data set is increased to support efficient deployment.

VI. CONCLUSION

The proposed Fake Job Posting Detector system combines the advantages of Natural Language Processing and Machine Learning techniques to detect fake job postings with high accuracy. The system can predict the potential fraud associated with the job posting by analyzing the description of the jobs, the company's profile, and the language used. The experimental results show the reliability of the system for different categories of jobs. The system's potential to provide real-time alerts for fraud can be useful to incorporate into various job portals, providing an effective solution to combat the problem of online job scams.

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