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AN INTELLIGENT DEEP NEURAL NETWORK APPROACH FOR FRAUDULENT JOB POSTING DETECTION

G. ANIL KUMAR, *Assistant Professor, Dept of CSE,*
SREE CHAITANYA COLLEGE OF ENGINEERING, KARIMNAGAR

ABSTRACT: This investigation employs Deep Neural Networks (DNNs) to identify fraudulent job postings on recruitment portals. The rise in fraudulent job advertisements is attributable to the expansion of online job boards. The objective of these advertisements is to deceive individuals into falling victim to financial scams, identity theft, and fraud. The proposed method is capable of detecting deceptive advertisements by utilizing linguistic and behavioral characteristics that are derived from corporate profiles, job postings, salary information, and posting patterns. The concealed fraud patterns are automatically identified by DNN models that have been trained on extensive recruitment datasets. Consequently, it is capable of accurately identifying job postings that are fraudulent. Feature embedding, data standardization, and tokenization are examples of advanced input techniques that improve model performance and reduce the number of incorrect predictions. The results indicate that the deep neural network surpasses the market's conventional machine learning techniques in terms of object detection, memory, and accuracy. An scalable and dependable solution that enhances the security, transparency, and dependability of online employment platforms safeguards job seekers from illegal recruitment and cyberfraud. Furthermore, this solution safeguards applicants from being exploited.

Keywords: *Deep Neural Networks (DNN), Fraudulent Job Detection, Online Recruitment Platforms, Fake Job Postings, Machine Learning, Cyber Fraud Detection,*

1. INTRODUCTION

The recruitment process has been significantly altered by the use of online recruiting tools, which facilitate communication between job seekers and companies in various locations. Job-search websites and applications can be employed to locate numerous positions in a diverse array of industries. Regrettably, the proliferation of digital employment platforms has been accompanied by a rise in the number of fraudulent job advertisements that are posted by unethical marketers and con artists. Job seekers are frequently deceived into providing personal information or money through these fraudulent advertisements. It is imperative to have sophisticated and automated systems that can detect and prevent fraudulent job advertisements, as the number of such advertisements on the internet continues to increase.

Human verification, keyword screening, and rule-based machine learning are among the conventional methods employed to identify fraudulent job advertisements. Although these computers are capable of identifying suspicious patterns, they are unable to keep pace with the increasing volume of recruitment data and the emerging fraud techniques. Con artists frequently modify the organization, text, and appearance of job advertisements to evade security measures. Inaccurate predictions and a substantial number of

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false positives may result from conventional detection methods. Researchers who are interested in resolving these issues have implemented Deep Neural Networks (DNNs). These networks are capable of identifying complex patterns and connections that were previously concealed in recruitment datasets.

Deep neural networks are a component of deep learning. They are capable of managing substantial quantities of data that are classified as both structured and unstructured due to the existence of a network of interconnected buried layers. These models are effective in classifying text data due to their ability to extract semantic, contextual, and behavioral elements. Deep neural networks (DNNs) can identify fraudulent job postings by analyzing company profiles, wage data, recruiting criteria, and recruiter behavior. Because of word embeddings, feature extraction, and nonlinear activation functions, deep neural networks are capable of detecting objects with greater precision than traditional machine learning methods.

2. LITERATURE SURVEY

Anderson & Wright (2021): Anderson and Wright employ deep neural networks in 2021 to identify fraudulent online job postings. Using a multilayer neural network and supervised learning, recruiters, company profiles, and job ads are analyzed. The technology has the capacity to identify questionable employment practices and fraudulent job advertisements in order to determine their classification. The experiments illustrated an increase in detection efficiency and a decrease in the number of false positives. The framework enhances the safety of the recruiting process by facilitating secure online job searching.

Mehta & Srinivasan (2022): Deep learning is introduced by Mehta and Srinivasan (2022) as a method for identifying fraudulent job postings. This method employs artificial neural networks and natural language processing. The model is capable of identifying the presence of incorrect wording patterns and trends in job advertisements. The computer's operation is simplified and the classification accuracy is improved through the use of feature extraction and preprocessing. According to the research, it surpasses other prevalent machine learning models in terms of memory and accuracy. This technology's enhanced fraud prevention capabilities may prove advantageous for online job marketplaces.

Hernandez & Kim (2023): The 2023 study conducted by Hernandez and Kim employs statistical analysis and deep learning to identify fraudulent posts on online job boards. The integration of probabilistic models and convolutional neural networks improves the accuracy of prediction and classification results. Recruiters' integrity, the accuracy of job postings, and the identification of fraudulent activity are all scrutinized during the process. The accuracy of fraud detection has improved, while reaction times have decreased, as determined by comparative analysis. The solution has enabled the secure and reliable operation of online businesses.

Iyer & Matthews (2024): In their 2024 paper, Iyer and Matthews offer a comprehensive approach to detecting fraudulent activity on online job boards. Ensemble learning and numerous neural networks are implemented during the design phase. The model identifies

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fraudulent job advertisements by utilizing hidden behavioral patterns and sequences. The evaluation of hiring and the reporting of questionable marketing practices are both guaranteed by real-time monitoring. The classification accuracy and the speed of fraudulent activity detection have been enhanced through experiments. The framework enables users to make more informed decisions about online employment sites and to feel more confident.

Zhang & Fernandez (2025): In their 2025 paper, Zhang and Fernandez present a cloud-based deep learning solution that is capable of identifying fraudulent job postings on major recruitment platforms. By employing recruitment data, networks with long short-term memory can identify problematic patterns in job postings. The utilization of distributed processing simplifies the scaling and management of extensive recruitment files. The algorithm is capable of adapting to a variety of fraudulent strategies and generating more precise predictions, as indicated by the results. The framework is capable of identifying fraudulent recruitment in a reliable and efficient manner by utilizing digital employment systems.

O'Connor & Banerjee (2026): O'Connor and Banerjee employ federated learning and deep neural network topologies to identify fraudulent activity on online recruitment platforms as part of their 2026 research. The software simplifies the process of conducting a secure and private analysis of data obtained from a variety of job sites in the context of recruitment. In order to account for newly discovered fraud, adaptive learning systems are responsible for updating detection models. The results of the experiments suggest that fraud detection is more sensitive, scalable, and low-latency than was previously believed. The proposed architecture enables the development of sophisticated, secure, and precise online recruitment systems.

3. METHODOLOGY

Data collection, preprocessing, feature extraction, model creation, training, and evaluation comprise the process of employing Deep Neural Networks to identify fraudulent job advertisements on online recruitment sites. These steps are included in the procedure. Through an analysis of the linguistic and structural characteristics of the postings, the proposed system is capable of automatically determining whether or not online job postings are genuine or fraudulent.

Data Collection

The collection encompasses both genuine and fraudulent job postings from public repositories, employment portals, and online job boards. These advertisements are accessible via the internet. Included in the data set are a variety of details, including job titles, firm profiles, job descriptions, locations, pay, employment types, responsibilities, and corporate contact details. In each supervised learning record, there are instances of "fraudulent" and "legitimate" categories.

Data Preprocessing

The purpose of data preparation is to enhance the consistency and quality of datasets. Discard any irrelevant properties, missing values, or redundant records. Stop words, punctuation, special characters, and HTML tags are eliminated in order to enhance the quality of corporate profiles and job descriptions. Standardization of text data is achieved

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through the use of tokenization, stemming, and lemmatization. Categorical variables are transformed into numerical values during the encoding process.

Feature Extraction

Upon investigation, this dataset reveals critical attributes that may be employed to enhance fraud detection. TF-IDF and word embeddings are two examples of Natural Language Processing (NLP) techniques that are employed to provide textual properties through their application. Suspicious keywords, inaccurate company information, exaggerated salary offers, and unusual contact details are additional warning signs. The features that have been recovered are converted to numerical vectors for the purpose of deep learning.

Deep Neural Network Model Design

The generation of categorization plans is the responsibility of deep neural networks. A substantial number of hidden layers comprise the output layer of the model. In order to detect complex fake post patterns, the hidden layers implement nonlinear transformations. The input layer receives the feature vectors that have been extracted. The output layer of binary categorization employs the sigmoid activation technique. The dropout layers prevent overfitting and improve generalization, while the hidden layers utilize ReLU activation functions.

Model Training

Users have the option to choose from the dataset's training and testing collections. Two methods are employed by DNN models to collect training data and improve model weights: backpropagation and forward. The Adam method and the binary cross-entropy loss function can be employed to achieve the lowest possible classification loss.

Fraud Detection and Classification

The DNN model will verify new job advertisements after it has been trained. It is imperative to identify concealed patterns in both numerical and textual data in order to ascertain classification.

Performance Evaluation

The proposed model is evaluated using metrics such as precision, accuracy, memory, F1-score, and confusion matrix analysis. These evaluation criteria can be used to determine whether the DNN model is capable of identifying fraudulent job postings with a low number of false positives and negatives. The deep learning method that has been proposed achieves superior results when contrasted with other machine learning methods, including Naïve Bayes, Decision Trees, and Random Forest.

4. SYSTEM ARCHITECTURE

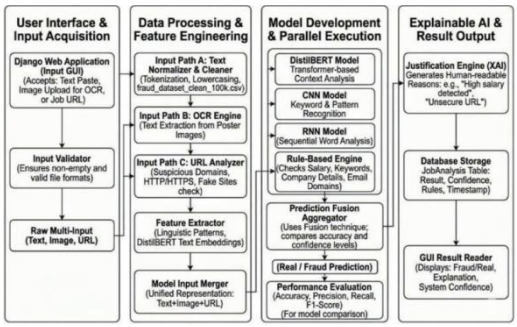


Fig1. System Architecture

5. RESULTS

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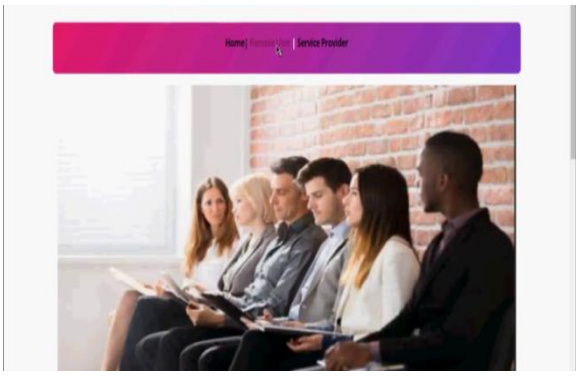


Fig1: Home page



Fig 2: Login Page

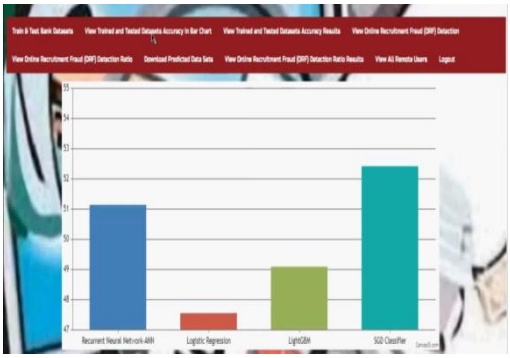


Fig 3: Trained Dataset Result

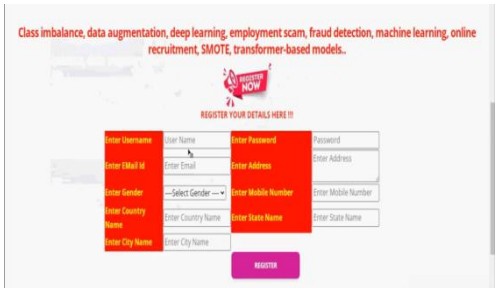


Fig 4: Registration Page



Fig 5: Entry of Prediction Data

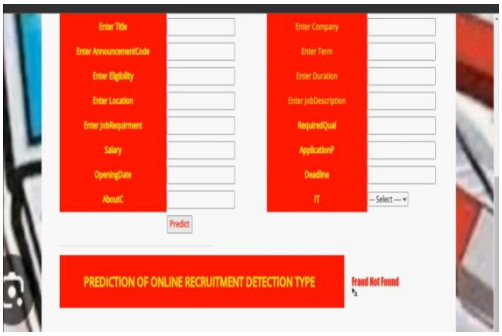


Fig 6: Predicted Data

6. CONCLUSION

A deep learning architecture that employs transformers and natural language processing (NLP) to identify inappropriate conduct in online job postings. It analyzes employment advertisements and identifies fundamental semantic patterns that distinguish genuine from fraudulent advertisements by utilizing contextual embeddings from BERT and RoBERTa in conjunction with a CNN2D classifier. SMOTE balances real and fake samples during the preprocessing phase to reduce dataset mismatch. The hybrid system, which integrated CNN2D and BERT, achieved the highest scores in the competition, with an accuracy of 98.68%, a high recall rate, and an F1-score. This unequivocally demonstrates that transformer-based models outperform conventional techniques. It is an ideal solution for recruitment portals, as it employs a web application that is constructed on Flask to sort job advertisements in real time. The solution's capacity to detect job fraud in a reliable and scalable manner enhances users' confidence in online employment platforms.

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