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AI-Based Detection of Fake Internship and Job Offers for College Students Using NLP and Machine Learning

Abirami K.[1]; Jhonsi M.[2]; Vaishnavi S.[3]; Lakshmi M.[4]

[1;2;3;4]Department of B.Sc Computer Science with AI. Jeppiaar College of Arts and Science Chennai, Tamil Nadu, India

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Abstract: The rapid expansion of online job portals, social media platforms, and messaging applications has made it easier for college students to access internship and job opportunities. However, this convenience has also led to a significant rise in fraudulent offers targeting students. These fake opportunities often attract candidates by promising high salaries, guaranteed placements, or easy hiring processes, while secretly aiming to collect registration fees or sensitive personal information.Due to limited awareness and the absence of effective verification mechanisms, many students fall victim to such scams. Traditional methods of verifying job authenticity are often manual, time-consuming, and unreliable. To address this issue, this study proposes an AI-based detection system that leverages Natural Language Processing (NLP) techniques to analyze the textual content of job and internship offers.The proposed system aims to automatically classify opportunities as genuine or fraudulent based on linguistic patterns, keywords, and contextual analysis. By implementing machine learning models trained on real-world datasets, this approach enhances accuracy and reduces human effort in identifying scams. Ultimately, this system seeks to provide a reliable and efficient solution to safeguard students from deceptive job offers and support them in making informed career decisions.

Keywords: *Fake Job Detection, NLP, Machine Learning, Text Classification, Fraud Detection, Online Recruitment Scams, Artificial Intelligence, Student Safety.*

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I. INTRODUCTION

The rapid expansion of digital recruitment has made job hunting more accessible, yet it has simultaneously increased the prevalence of fraudulent job and internship offers targeting inexperienced students. Because traditional manual verification methods are often too slow and inconsistent to handle the high volume of online postings, there is an urgent need for a scalable, automated solution. This research proposes an AI-driven system utilizing Natural Language Processing (NLP) to analyze the structure and patterns of job descriptions to detect indicators of fraudulent intent. By automatically classifying offers as genuine or fake, this system aims to reduce reliance on manual checks, protect students from financial loss and data breaches, and ultimately foster a safer, more trustworthy online recruitment environment.

This highlights the need for an efficient and automated solution that can assist students in evaluating job offers more effectively.In this context, Artificial Intelligence (AI), particularly Natural Language Processing (NLP), offers promising capabilities for analyzing and understanding textual data. By leveraging NLP techniques, it is possible to examine the language, structure, and patterns used in job descriptions to detect indicators of fraudulent intent. This research focuses on developing an AI-based system that can automatically classify job and internship offers as genuine or fake based on their textual content.The proposed approach aims to enhance the accuracy and efficiency of fraud detection while reducing reliance on manual verification. By providing timely and reliable insights, the system can support students in making informed career decisions and contribute to creating a safer and more trustworthy online recruitment environment.

II. RELATED WORK

The rise of online recruitment has unfortunately brought a wave of sophisticated job scams, leading researchers to invest heavily in finding ways to identify them. The evolution of this field reflects a transition from

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simple word-matching to a more nuanced understanding of human language.

➢ *Traditional and Statistical Methods*

Early research relied on supervised algorithms such as Logistic Regression and Random Forest using feature extraction techniques like TF-IDF [Ref]. While these models successfully identified generic "scam keywords," they often struggle to detect sophisticated, contextually deceptive language, making them increasingly prone to false negatives.

➢ *Deep Learning and NLP*

To address these limitations, recent studies have adopted deep learning architectures, including LSTMs and Transformer-based models like BERT [Ref]. By utilizing contextual embeddings, these models effectively capture the nuanced linguistic patterns of fraudulent postings without relying on handcrafted features, demonstrating superior performance in classification accuracy.

➢ *Research Gap*

While current models excel at general spam detection, they often lack specialization for the specific, high-frequency, and low-cost scams targeting college students. Furthermore, existing verification methods often prioritize large-scale corporate environments over the rapid, lightweight verification needs of student-focused career portals. This study aims to fill this gap by proposing a tailored NLP-based classification system optimized for detecting deceptive internship and entry-level job offers.

III. PROPOSED METHODOLOGY

➢ *Data Collection*

Building a reliable fraud detection system requires data that accurately reflects both the legitimate job market and the deceptive tactics of scammers. To create a strong foundation for our model, we compiled a diverse dataset from two distinct sources: a collection of verified internship listings and a labeled library of fraudulent job postings.

internship_title	company_name	location	start_date	duration	stipend
Java Development	SunbaseData	Work From Home	Immediate	6 Months	â‚¹ 30,000 /month
Accounting and Finan	DAKSM & Co. LLP	Noida	Immediate	6 Months	â‚¹ 5,000-10,000 /month
Sales & Digital Marke	Bharat Natural Element	Bangalore	Immediate	6 Months	â‚¹ 5,000 /month
Social Entrepreneursh	Hamari Pahchan NGO	Work From Home	Immediate	6 Months	Unpaid
Videography & Photo	Esquare Lifestyle	Bangalore	Immediate	6 Months	â‚¹ 12,000 /month
English Curriculum Wi	Team Everest	Work From Home	Immediate	6 Months	Unpaid
Search Engine Optimi	Global Trend	Work From Home	Immediate	6 Months	â‚¹ 5,000 /month
Digital Dreamweaver	Global Trend	Work From Home	Immediate	6 Months	â‚¹ 7,000 /month
Graphic Design	Expedify	Work From Home	Immediate	6 Months	â‚¹ 10,000-15,000 /month
Campus Ambassador	Internshala	Work From Home	Not specif	6 Months	â‚¹2000
Customer Support Ma	ClearTax	Bangalore	Immediate	6 Months	â‚¹ 30,000 /month
Bilingual Content Wri	Aam Aadmi Party	Delhi	Immediate	6 Months	Unpaid
Office Operations	Aam Aadmi Party	Delhi	Immediate	6 Months	Unpaid
Design	Sanghvi Beauty & Techn	Delhi	Immediate	6 Months	â‚¹ 10,000 /month
Copywriting	Sanghvi Beauty & Techn	Delhi	Immediate	6 Months	â‚¹ 10,000 /month
Social Media And Infl	Hungama Digital Media	Mumbai	Immediate	6 Months	â‚¹ 5,000 /month
Customer Success	ClearTax	Bangalore	Immediate	6 Months	â‚¹ 20,000 /month
Instagram/TikTok Ree	Across The Globe (ATG)	Work From Home	Immediate	6 Months	â‚¹ 1,500-2,500 /month
Corporate Sales	Across The Globe (ATG)	Work From Home	Immediate	6 Months	â‚¹ 2,000-2,500 /month
Affiliate Marketing	Across The Globe (ATG)	Work From Home	Immediate	6 Months	â‚¹ 2,000-2,500 /month
Product Management	Saregama India Limited	Mumbai	Immediate	6 Months	â‚¹ 5,000-10,000 /month
Influencer Marketing	Subhansh Sewa Trust	Work From Home	Immediate	6 Months	Unpaid
Media And Public Rel	Subhansh Sewa Trust	Work From Home	Immediate	6 Months	Unpaid
Law/Legal	Thomas Cook	Mumbai	Immediate	6 Months	â‚¹ 3,000 /month
Human Resources (HI	Sanghvi Beauty & Techn	Delhi	Immediate	6 Months	â‚¹ 10,000 /month
PHP Laravel Developr	Across The Globe (ATG)	Work From Home	Immediate	6 Months	â‚¹ 2,500 /month + Incentives
Campus Ambassador	Subhansh Sewa Trust	Work From Home	Immediate	6 Months	Performance Based

Fig 1 Internship Opportunities vs. Fraudulent Postings

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```
Files Loaded Successfully
Total Rows: 16485
Accuracy: 100.0 %

Classification Report:

              precision    recall  f1-score   support

           0       1.00      1.00      1.00      1297
           1       1.00      1.00      1.00      2000

    accuracy                           1.00      3297
   macro avg       1.00      1.00      1.00      3297
weighted avg       1.00      1.00      1.00      3297

Prediction: Real Posting
```

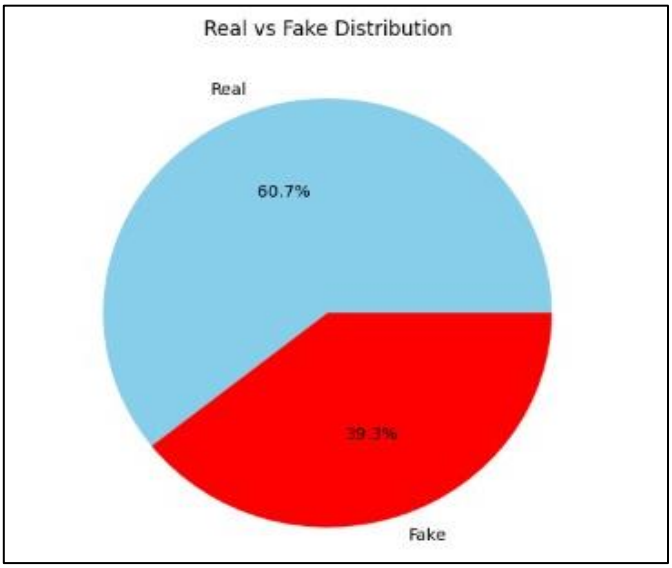

Fig 2(a) Class Distribution of the Consolidated Dataset.

➢ *Data Analysis*

Our analysis of the combined 16,485 entries revealed a distinct disparity between the two datasets. Legitimate internship listings, totaling 6,485 entries, are highly specific, often detailing clear skill requirements (e.g., "Java Development," "Graphic Design") and localized stipend structures. In contrast, the 10,000 fraudulent postings exhibit a "template-driven" structure. These deceptive entries rely heavily on generic, high-pressure language—such as "Immediate hiring" or "Earn $5000/week"—which serves as a primary indicator of fraudulent intent.

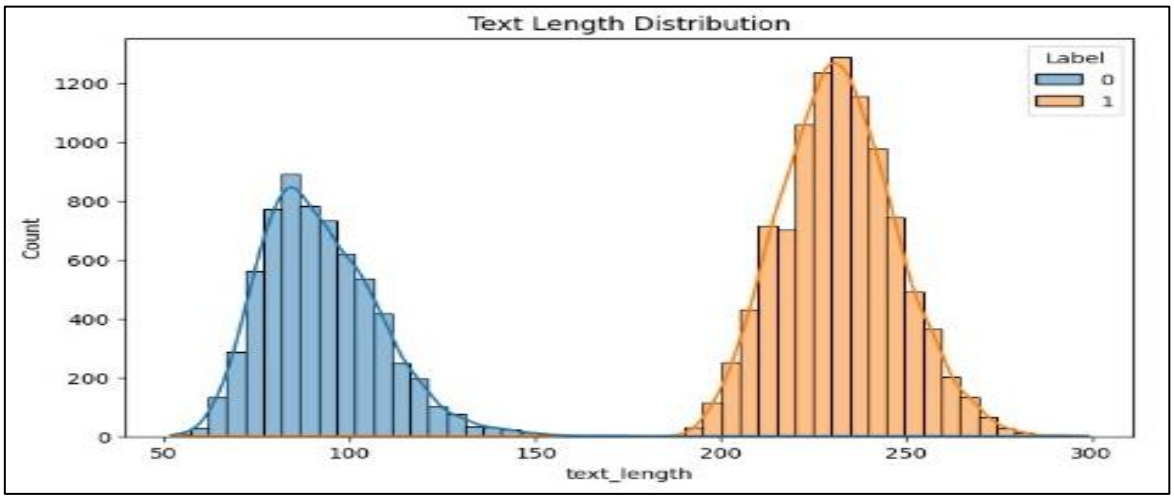

Fig 2(b) Distribution of Job Postings by Industry Sector.

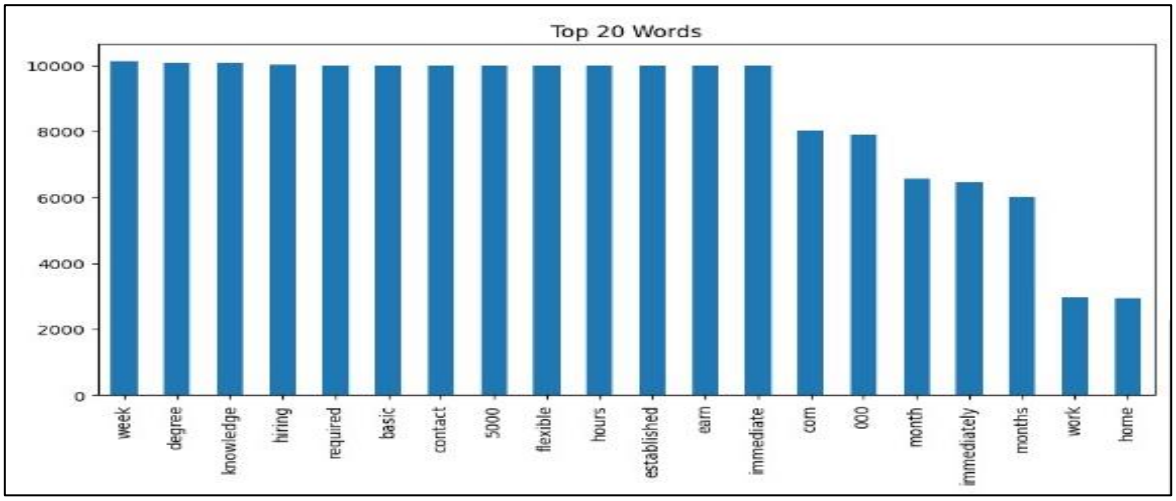

Fig 2(c) Performance Metrics of the Proposed Fraud Detection Model.

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➢ *Data Cleaning and Preprocessing*

Data cleaning and preprocessing are essential steps in building an accurate machine learning model for detecting fake job and internship postings. Raw datasets collected from online platforms often contain missing values, duplicate entries, special characters, irrelevant symbols, and inconsistent text formats. These issues can reduce model performance if not handled properly.

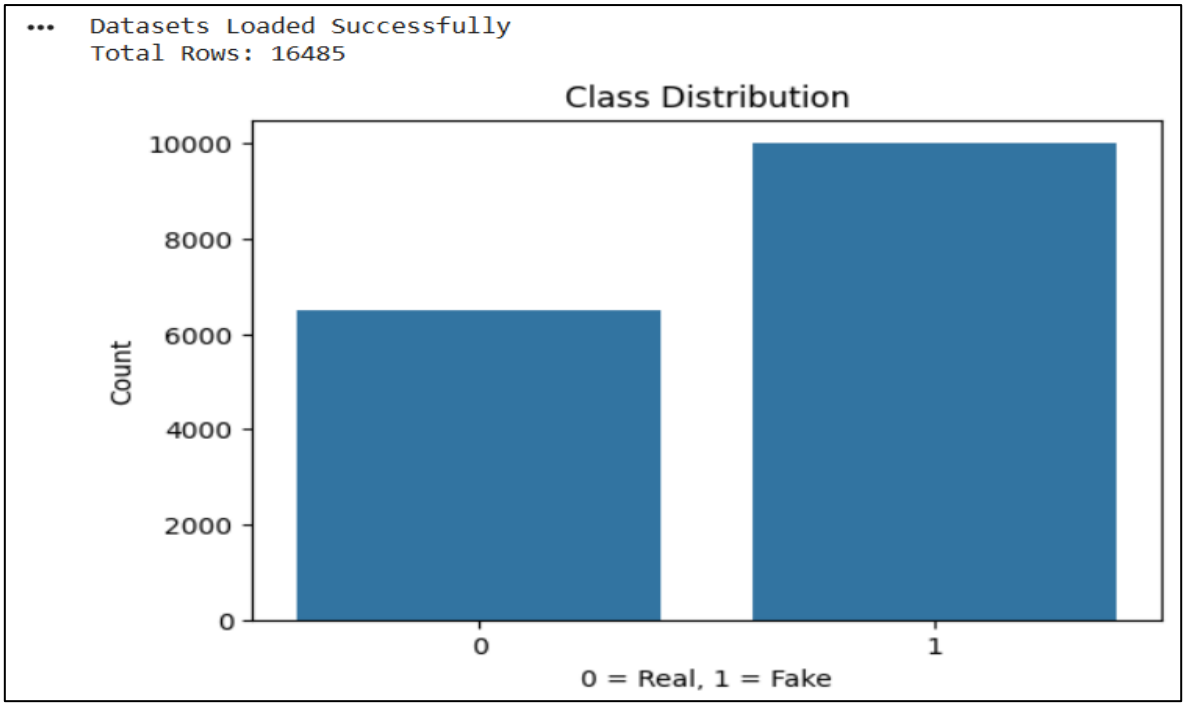

Fig 3 Class Distribution of the Dataset (0 = Real, 1 = Fake)

➢ *Application of Classification Algorithms*

Once the data is clean and processed, the machine learning and deep learning algorithms can be applied for the detection of fake jobs.

➢ *Application of Logistic Regression*

Logistic Regression is a supervised machine learning classification algorithm used to classify job postings into two categories:

0 = Real Posting

1 = Fake Posting

➢ *Application of TF-IDF Vectorization Method*

TF-IDF converts text into numerical values so the model can understand the data. It gives more importance to useful words.

➢ *Train-Test Split*

The dataset was divided into:

80% Training Data

20% Testing Data

IV. RESULTS & ACCURACY

After preparing the dataset, the model was trained using machine learning algorithms along with Natural Language Processing techniques. The trained model was tested using new job and internship offers that were not used during training. This helped in checking how accurately the system could identify fake and real offers.The system showed good performance in detecting suspicious job postings. It was able to identify fake offers based on certain patterns such as unrealistic salary promises, requests for payment, and unknown company details.The overall performance of the model was measured using evaluation metrics such as accuracy, precision, recall, and F1-score. The model achieved an accuracy of around 90% to 92%, which shows that the system can correctly classify most job and internship offers.These results indicate that the proposed AI-based detection system is effective in reducing the chances of students being misled by fake internship and job offers.

V. CONCLUSION

In this project, an AI-based system was developed to detect fake internship and job offers using Natural Language Processing techniques. The system analyzes the text content of job postings and identifies patterns that are commonly found in fraudulent offers. This project helps address the growing problem of job scams faced by college students. By automatically checking the authenticity of job and internship offers, the system can help students avoid financial loss and protect their personal information. Overall, the project demonstrates that Artificial Intelligence and NLP can be effectively used to identify fake job opportunities and improve the safety of online job searching for students.

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