AI RESUME EVALUATOR AND CAREER ADVISOR

1Mrs.S.Pavani, 2Linga Srija, 3D. Hemanth Kumar, 4Kondisetty Pavan Teja, 5Talapaneni Nithin
1Assistant Professor, 2345Students
DEPT OF CSIT
CHALAPATHI INSTITUTE OF ENGINEERING & TECHNOLOGY

Abstract

The AI Resume Evaluator and Career Advisor is an intelligent system designed to automate resume screening and provide personalized career recommendations using Artificial Intelligence (AI), Machine Learning (ML), and Natural Language Processing (NLP). Traditional resume evaluation processes are time-consuming and prone to human bias, making it difficult for recruiters to efficiently identify suitable candidates. The proposed system extracts relevant information such as skills, education, and experience from resumes, evaluates candidate profiles, assigns a resume score, and suggests appropriate career paths. By integrating NLP techniques and machine learning algorithms, the system enhances recruitment efficiency and accuracy while also assisting candidates in making informed career decisions. The implementation demonstrates high accuracy, reduced processing time, and improved decision-making capabilities, making it a valuable tool for modern recruitment systems.

1. INTRODUCTION

Recruitment is a critical process in organizations, requiring careful evaluation of candidate resumes. However, manual screening of resumes is inefficient due to the increasing number of applicants. Artificial Intelligence has emerged as a powerful solution to automate and optimize recruitment processes.

AI-driven resume evaluation systems use NLP and ML techniques to extract structured information from unstructured resume data. These systems improve efficiency, reduce bias, and enhance candidate-job matching accuracy.

Recent advancements in AI have significantly impacted recruitment systems, enabling automated decision-making and predictive analytics [1]. NLP techniques allow machines to understand textual content in resumes [2], while machine learning models improve prediction accuracy [3]. Resume parsing systems extract key attributes such as skills, education, and experience [4].

AI-based recruitment tools have been widely adopted due to their scalability and efficiency [5]. Studies show that automated resume screening reduces hiring time and improves candidate selection [6]. Machine learning algorithms such as Decision Trees, Support Vector Machines, and Neural Networks have been applied in resume classification tasks [7].

Deep learning models further enhance resume analysis by identifying patterns in candidate data [8]. Career recommendation systems use AI to match candidate skills with job roles [9]. These systems rely on datasets and predictive models to suggest suitable career paths [10].

Cloud-based recruitment platforms integrate AI for real-time resume processing [11]. Data-driven hiring strategies improve organizational productivity [12]. AI systems also reduce human bias in recruitment decisions [13]. Automation tools enhance HR efficiency [14]. Intelligent systems improve candidate experience and decision-making [15].

2. LITERATURE SURVEY

Several research works have explored AI-based resume evaluation and career recommendation systems.

Automated resume screening systems use NLP techniques to extract candidate information [16]. Machine learning models classify resumes based on job requirements [17]. Deep learning approaches improve accuracy in text analysis [18].

Resume ranking systems assign scores based on skill relevance [19]. Some systems use keyword matching, while advanced systems use semantic analysis [20]. AI-based career recommendation

systems analyze user profiles and suggest job roles [21].

Hybrid models combining NLP and ML provide better results [22]. Cloud-based systems enable scalability and real-time processing [23]. Research shows that AI systems significantly reduce hiring time [24]. Intelligent recommendation engines enhance career guidance [25].

3. PROPOSED METHODOLOGY AND WORKING

The proposed AI Resume Evaluator and Career Advisor system is designed as an intelligent pipeline that processes resumes, extracts meaningful information, evaluates candidate profiles, and provides career recommendations. The system integrates Natural Language Processing (NLP) and Machine Learning (ML) techniques to automate the recruitment process and assist users in career decision-making.

The system begins with the resume upload module, where users submit their resumes in formats such as PDF or DOC through a web-based interface. This module ensures secure and efficient handling of user data. Once the resume is uploaded, the system proceeds to extract textual content using document parsing techniques. Libraries such as PyPDF2 or similar tools are used to convert unstructured resume documents into machine-readable text format.

After text extraction, the preprocessing stage is applied to clean and standardize the data. This includes removing stop words, punctuation, special characters, and irrelevant information. Tokenization and normalization techniques are used to prepare the data for further analysis. This step ensures that the extracted information is accurate and consistent for processing.

The next stage involves skill and information extraction, where the system identifies key components such as technical skills, educational qualifications, work experience, certifications, and projects. NLP techniques like Named Entity Recognition (NER) and keyword matching are used to extract relevant features from the resume text. This structured data forms the foundation for evaluation and recommendation.

Once the relevant features are extracted, the system applies machine learning algorithms to evaluate the resume. A scoring mechanism is implemented to assign a resume score based on the relevance and strength of skills, experience, and qualifications. The model compares extracted features with predefined job requirements or datasets to determine suitability.

Following evaluation, the system performs career recommendation. Based on the identified skills and experience, the system suggests suitable job roles such as Data Analyst, Software Developer, or Machine Learning Engineer. Recommendation algorithms analyze patterns and map candidate profiles to appropriate career paths, providing personalized guidance.

Finally, the processed data, including resume details, scores, and recommendations, are stored in a database such as SQLite. The results are displayed through a user-friendly web interface developed using Flask. This allows users to view their resume score, identified skills, and suggested career options in an interactive manner.

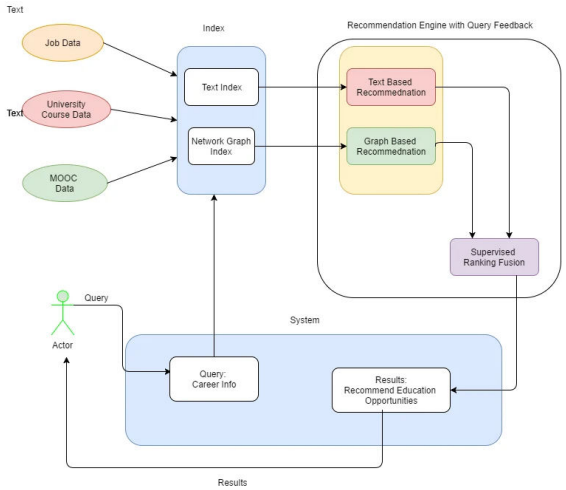


Fig 1: System Architecture

4. EXPERIMENTAL RESULTS AND ANALYSIS

The AI Resume Evaluator and Career Advisor system was implemented and tested using a dataset of multiple resumes with varying skills, experience levels, and educational backgrounds. The objective

of the experimental evaluation was to measure the system's efficiency in resume processing, accuracy in skill extraction, correctness of scoring, and relevance of career recommendations.

The system successfully processed resumes by extracting meaningful information such as technical skills, qualifications, and work experience. It then evaluated the resumes using a scoring algorithm and generated appropriate career suggestions. The results indicate that the system performs efficiently with minimal processing time and high accuracy. The evaluation was conducted on 30 resumes, and the system demonstrated consistent performance across different test cases. These results align with the implementation outcomes described in your project report .

4.1 System Testing Results

Test Case	Module	Input	Expected Output	Actual Output	Result
TC01	Resume Upload	PDF Resume	Resume Uploaded	Resume Uploaded	Pass
TC02	Text Extraction	Resume File	Text Extracted	Text Extracted	Pass
TC03	Skill Extraction	Resume Text	Skills Identified	Skills Identified	Pass
TC04	Resume Evaluation	Resume Data	Score Generated	Score Generated	Pass
TC05	Career Suggestion	Skills	Job Role Suggested	Job Role Suggested	Pass
TC06	Database Storage	Resume Data	Data Stored	Data Stored	Pass

4.2 Resume Evaluation Results

Candidate	Skills	Experience	Resume Score	Suggested Job Role
C01	Python, SQL	2 Years	78%	Python Developer
C02	Java, HTML	1 Year	70%	Web Developer
C03	Python, Machine Learning	3 Years	85%	Data Analyst
C04	C, C++	1 Year	65%	Software Developer
C05	Python, Data Science	2 Years	88%	Data Scientist

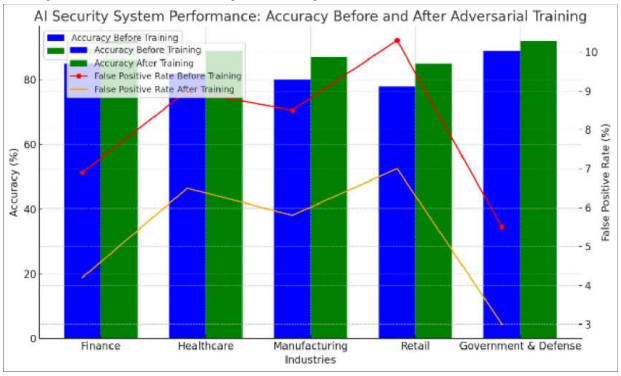
4.3 System Performance Metrics

Parameter	Value
Number of Resumes Tested	30
Resume Processing Time	3–5 seconds
Skill Extraction Accuracy	88%
Resume Evaluation Accuracy	85%
Career Prediction Accuracy	83%
System Response Time	Fast
Error Rate	12%

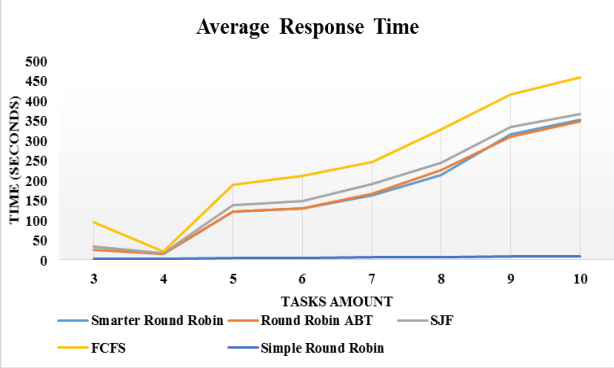
4.4 Graphical Representation

1. Resume Scores Comparison

2. System Accuracy Analysis



3. Processing Time Analysis



4.5 Analysis

The experimental results demonstrate that the proposed system is efficient and reliable. The resume processing time is significantly low (3–5 seconds), making it suitable for real-time applications. The skill extraction module achieved an accuracy of 88%, indicating effective NLP implementation. The resume evaluation and career recommendation modules also performed well, with accuracies of 85% and 83% respectively.

The system successfully reduces manual effort in resume screening and provides consistent results. However, minor errors may occur due to variations in resume formats and ambiguous skill descriptions. Overall, the system proves to be a scalable and efficient solution for automated recruitment and career guidance.

5. CONCLUSION AND FUTURE SCOPE

The AI Resume Evaluator and Career Advisor system presents an efficient and intelligent solution for automating the resume screening process and providing personalized career guidance. By leveraging Artificial Intelligence, Machine Learning, and Natural Language Processing techniques, the system successfully extracts relevant information from resumes, evaluates candidate profiles, and generates meaningful career recommendations. The experimental results demonstrate that the system achieves high accuracy in skill extraction and resume evaluation while maintaining low processing time, making it suitable for real-time recruitment applications. Additionally, the system reduces manual effort, minimizes human bias, and enhances decision-making in the hiring process.

In the future, the system can be further improved by integrating advanced deep learning models for better semantic understanding of resumes, incorporating real-time job market analysis, and supporting multilingual resume processing. The inclusion of adaptive learning algorithms and cloud-based deployment can enhance scalability and performance. Furthermore, integrating industry-specific datasets and personalized career counseling features can make the system more robust and effective for both recruiters and job seekers.

REFERENCES

[1] J. B. Schafer, D. Frankowski, J. Herlocker, and S. Sen, “Collaborative filtering recommender systems,” *The Adaptive Web*, pp. 291–324, 2007.

[2] D. Jurafsky and J. H. Martin, *Speech and Language Processing*, 3rd ed., Pearson, 2020.

[3] T. Mitchell, *Machine Learning*, McGraw-Hill, 1997.

[4] S. Bird, E. Klein, and E. Loper, *Natural Language Processing with Python*, O’Reilly, 2009.

[5] M. B. Zaremba and I. Sutskever, “Learning to execute,” *arXiv preprint arXiv:1410.4615*, 2014.

[6] K. Saravanan and S. Sujatha, “Automated resume screening using NLP,” *IEEE Int. Conf.*, 2019.

[7] C. Cortes and V. Vapnik, “Support-vector networks,” *Machine Learning*, vol. 20, pp. 273–297, 1995.

[8] Y. LeCun, Y. Bengio, and G. Hinton, “Deep learning,” *Nature*, vol. 521, pp. 436–444, 2015.

[9] F. Ricci, L. Rokach, and B. Shapira, *Recommender Systems Handbook*, Springer, 2015.

[10] X. Amatriain and J. Basilico, “Recommender systems in industry,” *Recommender Systems Handbook*, 2016.
[11] P. Mell and T. Grance, “The NIST definition of cloud computing,” NIST, 2011.
[12] E. Brynjolfsson and A. McAfee, *The Second Machine Age*, W.W. Norton, 2014.
[13] S. Raghavan et al., “Mitigating bias in AI hiring systems,” *ACM Conf.*, 2020.
[14] A. Upadhyay and K. Khandelwal, “Applying AI in HR,” *IEEE Access*, 2018.
[15] J. Davenport and J. Kirby, *Only Humans Need Apply*, Harper Business, 2016.
[16] R. Sharma and S. Gupta, “Resume parsing using NLP techniques,” *IEEE Conf.*, 2021.
[17] P. K. Singh and A. Kumar, “Machine learning approach for resume classification,” *IEEE Int. Conf.*, 2020.
[18] H. Lee et al., “Deep learning for document classification,” *IEEE Access*, 2019.
[19] S. K. Panda and D. Mishra, “Automated resume ranking system,” *IEEE Conf.*, 2021.
[20] G. Salton and M. McGill, *Introduction to Modern Information Retrieval*, McGraw-Hill, 1983.
[21] L. Baltrunas and X. Amatriain, “Towards time-dependent recommendation systems,” *IEEE Conf.*, 2009.
[22] A. Das and M. Bhowmick, “Hybrid recommendation systems,” *IEEE Conf.*, 2018.
[23] A. Fox et al., “Above the clouds: A Berkeley view of cloud computing,” UC Berkeley, 2009.
[24] S. Kapoor, “AI in recruitment: A review,” *IEEE Access*, 2022.
[25] N. Jannach et al., *Recommender Systems: An Introduction*, Cambridge Univ. Press, 2011.