

AI-Based Resume Ranking System Using TF-IDF and Similarity Matching

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Abstract

This research explores the implementation of an AI-based resume ranking system using TF-IDF (Term Frequency-Inverse Document Frequency) for similarity scoring between resumes and job descriptions. The proposed model allows uploading of resume and job description files, extracts the text content, applies natural language processing (NLP) techniques such as tokenization and stopword removal, and then ranks the resume on a scale of 1–10 based on textual similarity. This method provides a lightweight, interpretable solution for HR departments to streamline candidate screening without complex black-box models.

Key Words: AI, Resume Screening, TF-IDF, Natural Language Processing, FastAPI, Candidate Ranking.

1. INTRODUCTION

Resume screening is one of the most time-consuming tasks in the recruitment process. In this paper, we present a system that automates the comparison of resumes against job descriptions using a simple NLP-based model. This reduces human bias, increases efficiency, and provides consistent evaluation metrics.

2. METHODOLOGY

The system uses FastAPI for a lightweight backend, and NLTK for NLP operations. Users upload resume and job description files. After parsing, text is processed using TF-IDF to evaluate similarity. The final similarity score is scaled to a 1–10 ranking, and a commentary is generated based on this score.

Table -1: Resume Ranking Visualized as Bar Graph

Candidate Name	Score	Visual Bar
Candidate A	9	<div></div>

Candidate B	7	<div><div></div></div>
Candidate C	6	<div><div></div></div>
Candidate D	4	<div><div></div></div>
Candidate E	2	<div><div></div></div>

3. RESULTS

The visual ranking table shows comparative similarity-based rankings for multiple candidates. The bars represent the strength of resume-to-job-description matches.

4. CONCLUSIONS

The proposed resume ranking system is effective in providing quick assessments of candidate-job fit using accessible AI methods. It is particularly useful for small HR teams or startups lacking the infrastructure for complex applicant tracking systems.

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REFERENCES

1. Bird, S., Klein, E., & Loper, E. (2009). Natural Language Processing with Python. O'Reilly Media Inc.
2. Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., ... & Duchesnay, É. (2011). Scikit-learn: Machine Learning in Python. Journal of Machine Learning Research, 12, 2825-2830.