

AI Resume Analyzer: An Intelligent System for Automated Resume Screening and Skill Matching

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Peer Review Information	Abstract
Type: Article Received: 30 March 2026 Revised: 25 April 2026 Accepted: 03 June 2026 Published: 22 June 2026	Recruitment has become more demanding because organizations receive a large number of resumes for every job opening. Reviewing each resume manually takes time and the results can differ from one reviewer to another. In many cases, strong candidates may be overlooked due to workload or time pressure. This paper presents a Resume Analyzer that uses machine learning and natural language processing to read and evaluate resumes automatically. The system extracts information such as skills, education, and experience, and compares them with job descriptions to estimate how well a candidate fits a role. The proposed system helps recruiters work faster and in a more consistent way. Test results show that it reduces screening effort while still providing reliable matching outcomes. Keywords: Artificial Intelligence; Resume Analyzer; Resume Parsing; Natural Language Processing; Machine Learning; Recruitment Automation; Skill Matching; Human Resource Analytics.

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Introduction

Organizations often receive hundreds or thousands of resumes for a single job role. Checking them one by one is slow and can lead to mistakes or inconsistent decisions. Recruiters also work under tight deadlines, which can affect how carefully each resume is reviewed.

Technology offers a practical way to support this process. A Resume Analyzer can scan resumes, identify key skills, and rank candidates based on job requirements. This study focuses on a system that compares resumes with job descriptions in a structured and efficient manner.

Literature Review

Previous studies show a steady rise in the use of technology in recruitment. NLP-based resume parsers are commonly used to convert unstructured resumes into organized information. Machine learning models have also been applied to group resumes and estimate candidate suitability.

More recent work suggests that semantic matching methods, such as word embeddings, perform better than simple keyword searches. However, concerns about fairness, transparency, and scalability still remain, which encourages further improvement in recruitment tools.

With the rapid growth of online recruitment platforms, organizations are overwhelmed with massive volumes of applications [1]. Manual resume screening consumes significant time and resources and is often affected by inconsistency and unconscious bias [2]. AI-driven recruitment systems address these issues by automating resume parsing, extracting relevant skills, and ranking candidates based on objective, data-driven criteria [3]. AI-based resume analyzers support recruiters by improving efficiency, enhancing decision accuracy, and ensuring a fairer and more transparent hiring process [4].

Recent research demonstrates that NLP techniques are highly effective in transforming unstructured resume documents into structured data [1]. Machine learning models such as Support Vector Machines, Random Forests, and Deep Neural Networks have been widely applied for resume classification and job–candidate matching [2]. More advanced semantic similarity techniques using word embeddings and transformer-based architectures have further improved matching accuracy [3]. However, concerns regarding transparency, scalability, and algorithmic bias remain key challenges, motivating the need for intelligent and explainable recruitment systems [4].

Several studies have emphasized the importance of integrating machine learning with semantic analysis to improve candidate-job matching. Transformer-based language models and contextual embeddings have demonstrated superior performance compared with traditional keyword-based approaches. These developments indicate that intelligent recruitment systems can significantly enhance hiring efficiency while maintaining consistency and fairness in candidate evaluation.

Methodology

Figure 1 illustrates the overall workflow of the proposed AI Resume Analyzer system. The methodology is designed as a multi-stage intelligent pipeline that ensures accurate extraction, processing, and matching of resume data with job requirements.

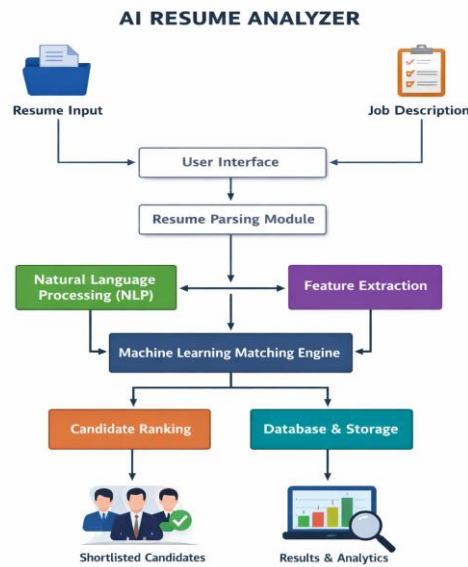


Fig. 1. Flow Diagram of AI Resume Analyzer

Figure 1 presents the workflow of the Resume Analyzer system. The process follows a step-by-step pipeline to ensure resumes are handled in a consistent way.

Resumes and job descriptions are first uploaded through a user interface. The parser converts files into readable text. Cleaning steps such as tokenization, stop-word removal, and lemmatization are applied to prepare the data.

The system then identifies details like skills, education, certifications, and experience. Techniques like TF-IDF and embeddings convert text into numerical form. A matching engine compares resumes with job descriptions and assigns similarity scores. Candidates are ranked and stored for later review.

This pipeline keeps the evaluation process systematic and reduces manual effort.

The system follows a pipeline consisting of resume collection, text extraction, data preprocessing, feature engineering, machine learning-based matching, and ranking. [1] NLP techniques are used to identify skills, experience, and education. [2] Feature vectors are generated using TF-IDF and embeddings. [3] A similarity model computes relevance scores between resumes and job descriptions. [4]

Proposed Framework

The framework includes a resume upload interface, a parsing module, a language processing component, a matching engine, a database, and a dashboard for viewing results. Because the design is modular, it can be scaled or integrated with existing HR systems without major changes.

Conclusion

The Resume Analyzer shows how technology can support recruiters by reducing the time spent on early-stage screening. It makes the process more organized and consistent.

Future improvements may include multilingual support, advanced learning models, and clearer explanations of how matches are calculated so recruiters can better understand the results.

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