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Enhancing Recruitment through NLP-Driven Resume Screening

The recruitment process in modern organizations increasingly relies on automation to efficiently screen large volumes of resumes. Traditional manual evaluation of resumes is time-consuming, subjective, and often inconsistent, which highlights the need for intelligent systems capable of extracting and analyzing candidate skills in a structured manner. To address this challenge, this project introduces a Resume Analyzer built on Natural Language Processing (NLP) techniques, providing a systematic approach to text extraction, preprocessing, and skill evaluation.

The system accepts resumes in PDF and DOCX formats, extracts textual information using PyMuPDF and python-docx, and applies preprocessing methods including lowercasing, tokenization, stopword removal, and lemmatization through NLTK. Once cleaned, the textual data is compared against a predefined set of professional skills covering domains such as programming, data analysis, communication, and business tools. The analyzer identifies skills already present in the resume, highlights missing competencies, and generates a structured report containing both strengths and recommendations for improvement.

This dual evaluation not only benefits candidates by providing actionable insights to optimize their resumes but also assists recruiters by reducing manual effort and enhancing the accuracy of initial screening. The system is lightweight, extensible, and adaptable to different job profiles by modifying the underlying skill set, making it applicable to diverse recruitment scenarios.

By integrating open-source Python libraries and leveraging NLP-based text mining, this project demonstrates how intelligent automation can transform recruitment workflows. The Resume Analyzer therefore acts as a bridge between candidates seeking to enhance their employability and organizations striving to streamline talent acquisition.

Keywords:Resume Analyzer, Natural Language Processing, Automated Screening, Text Extraction, Tokenization, Lemmatization, Skill Gap Analysis, Recruitment Automation, PyMuPDF, NLTK

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