**ABSTRACT**

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**AUTOMATED RESUME SCREENING TOOL**

Problem Statement

HR departments and recruiters often face the challenge of managing hundreds or even thousands of resumes for a single job opening. Manually screening these resumes is a time-consuming process and is prone to human error. Furthermore, unconscious bias can sometimes influence the selection process, leading to a less diverse candidate pool. An automated resume screening tool can address these challenges by streamlining the initial screening phase, ensuring that only the most relevant candidates are considered for further evaluation.

Abstract

The Automated Resume Screening Tool is designed to enhance the efficiency and accuracy of the recruitment process by leveraging Natural Language Processing (NLP) and Machine Learning (ML) technologies. The tool automates the initial screening of resumes, reducing the time and effort spent by HR departments and recruiters while minimizing human biases. Built in Java, the tool parses and analyzes resumes against specific job descriptions, scoring and ranking candidates based on their relevance to job requirements. Key features include resume parsing, keyword matching, semantic analysis, and bias detection. The tool can also integrate with Applicant Tracking Systems (ATS) to streamline data management and workflow. By providing a ranked list of top candidates and flagging potential issues like employment gaps or missing qualifications, this tool supports more informed hiring decisions and improves the overall efficiency of the recruitment process.

Software Requirements

Backend

* Java: Core programming language for implementing backend logic and processing.
* Spring Boot: Framework for developing RESTful APIs and managing application components.
* Apache OpenNLP/Stanford NLP/NLP4J: Libraries for NLP tasks such as tokenization, named entity recognition, and dependency parsing.
* Deeplearning4j/Weka: Java ML libraries for implementing complex ranking and scoring algorithms.
* Apache PDFBox/Apache POI: Libraries for parsing and extracting text from PDF and DOCX files, respectively.
* Apache Lucene/Elasticsearch: Libraries for semantic search and context-aware resume evaluation.
* MySQL/MongoDB: Databases for storing parsed resume data and job descriptions.
* Log4j: Logging framework for monitoring and debugging application activities.

Frontend

* React/Angular: Front-end frameworks for building an interactive user interface for HR professionals.
* HTML/CSS/JavaScript: Standard web technologies for designing and styling the user interface.

Integration

* REST APIs: For seamless integration with Applicant Tracking Systems (ATS) like Greenhouse, Lever, or BambooHR.

Development and Testing

* JUnit/TestNG: Testing frameworks for validating application functionality and performance.
* Maven/Gradle: Build automation tools for managing project dependencies and builds.
* Docker: Containerization platform for consistent development and deployment environments.

Deployment

* AWS/GCP/Azure: Cloud platforms for deploying the application and managing resources.
* Kubernetes/Docker Swarm: Orchestration tools for managing containers and ensuring scalability.
* Nginx/Apache HTTP Server: Web servers for handling client requests and serving content.

Security and Compliance

* SSL/TLS: Protocols for securing data transmission.
* OAuth 2.0/JWT: Authentication and authorization mechanisms for secure access control.
* Data Encryption Libraries: For securing sensitive personal information and ensuring compliance with regulations like GDPR and CCPA.

This comprehensive software stack ensures that the Automated Resume Screening Tool is robust, scalable, and secure, capable of efficiently processing large volumes of resumes and integrating smoothly into existing recruitment workflows.