

AI RESUME ANALYZER

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Abstract— This project is all about making the resume screening process smarter and easier. It uses Python and Google's Gemini AI to help analyze resumes and compare them with job descriptions. The tool can read both text-based and image-based PDF resumes by using smart libraries like pdfplumber and pytesseract. Once the resume content is extracted, it sends the information to Google's AI, which then gives insights like how well the candidate fits the job, what skills they already have, and what might be missing. This makes it a helpful assistant for recruiters who want to save time, and for job seekers who want honest, AI-powered feedback on their resumes. Overall, it aims to make hiring smoother and more data-driven.

Keywords— Resume Screening, Generative AI, Google Gemini, PDF Text Extraction, OCR, Resume Analysis, Job Matching, Natural Language Processing (NLP), Recruitment Automation, Python

I. INTRODUCTION

Going through resumes can be overwhelming—especially when there are hundreds to review for just one job opening. On the other side, job seekers are often unsure whether their resume truly matches what employers are looking for. This project was created to help with both sides of that challenge.

The Resume Analyzer is a simple yet powerful tool built with Python and Google Gemini AI. It can read resumes in PDF format—even if they're scanned or image-based—by using smart tools like pdfplumber, pytesseract, and pdf2image. Once the text is extracted from the resume, it's compared with a job description using Google's AI. The AI then gives detailed feedback, like how well the resume matches the job, what skills are missing, and where the candidate can improve.

Whether you're a recruiter who wants to save time or a job seeker who wants honest, helpful insights—this tool is designed to make the process easier, smarter, and more efficient for everyone involved.

II. LITERATURE SURVEY

The ResumeAtlas study introduced a comprehensive dataset of over 13,000 resumes and applied large-scale language models like Gemma 1.1 and BERT to the problem of resume classification. The researchers focused on training these models to understand the semantics of resumes better, thereby achieving a high accuracy rate of 97.5% in classifying resumes into job domains. Their approach emphasized the value of large datasets, contextual language models, and deep learning architectures in improving automation in hiring processes. This work set a new benchmark for performance and fairness in AI-based hiring tools.

In this research, resumes and job descriptions were modeled as documents to be ranked by semantic similarity using neural models. Instead of relying solely on keyword matches, the system evaluated the overall structure and meaning of each document. This allowed the system to identify the best-fit candidates even if their resumes didn't have exact keyword overlaps. The study showed that such deep document-ranking systems outperformed traditional rule-based or tf-idf matching methods, marking an important evolution in resume-job matching.

This paper proposed an end-to-end pipeline using BERT for sentence-pair classification between resumes and job descriptions. It began with parsing resumes into structured data and then used BERT to compare sections like experience, skills, and education with job requirements. The system could evaluate the contextual relevance of each section to the job, which significantly improved candidate ranking. This research emphasized BERT's strength in capturing deep semantic understanding in recruitment contexts.

A domain-adaptive Named Entity Recognition (NER) model based on BERT was trained to extract information such as names, skills, job titles, and educational qualifications from resumes. This research tackled the variability in resume formats by fine-tuning the model across multiple industries. The study showed that the BERT-based NER model performed better than rule-based extraction systems

and helped standardize resume data for further processing.

This paper proposed a complete resume analysis system that leverages NLP for keyword extraction, skill mapping, and job-role recommendation. It also integrates pre-processing techniques to clean and normalize resume data before applying matching algorithms. The proposed method reduces recruiter workload and increases matching consistency. Its simplicity and real-time processing potential make it a useful foundation for more complex AI-based resume analyzers.

The researchers in this paper addressed the problem of non-textual resumes, such as those in image format or scanned copies. They employed Optical Character Recognition (OCR) to convert images into readable text and then used NLP for information extraction. This approach allowed organizations to include resumes from diverse sources without format restrictions. The model ensured that the extracted text retained its structure for further semantic analysis.

A resume classification model was developed using machine learning to route resumes to appropriate job domains such as IT, healthcare, or education. It utilized features like skill sets and experience to cluster resumes and applied cosine similarity for comparing job requirements. The system reduced the manual effort of recruiters in filtering unrelated resumes and improved the initial shortlisting accuracy.

III. PROPOSED METHODOLOGY

This project focuses on building an AI-powered resume analyzer that compares a user’s resume with a job description and gives helpful suggestions for improvement. The user inputs both the resume and the job post through a simple web interface. Once submitted, the system cleans the text to remove any extra spaces, stop words, or irrelevant characters so it can focus on the important content. Using Google’s Gemini AI model, the system then analyzes the resume in detail — it looks at the candidate’s skills, experience, education, and compares all of it with the job description in a meaningful way, not just based on keyword matching. Finally, the app calculates a matching score and gives feedback on what the resume is missing or what can be improved. The results, including suggestions and the match percentage, are shown instantly on the screen, helping users make their resumes stronger and more job-ready in just a few seconds.

A. Alogrithm 1: Resume-Job Matching

This algorithm leverages Google’s Gemini AI to intelligently match a user’s resume with a job description by going beyond basic keyword comparisons. After the user uploads their resume and the job posting, the system first cleans the text to remove unnecessary elements. It then uses Gemini AI to deeply analyze both documents, understanding the context and meaning like a real recruiter would.

The AI evaluates how well the resume aligns with the job requirements, provides a match score (e.g., 82%), and offers personalized suggestions to improve the resume. These insights are instantly displayed on the web app, making it a powerful tool for job seekers looking to enhance their applications with meaningful, AI-driven feedback.

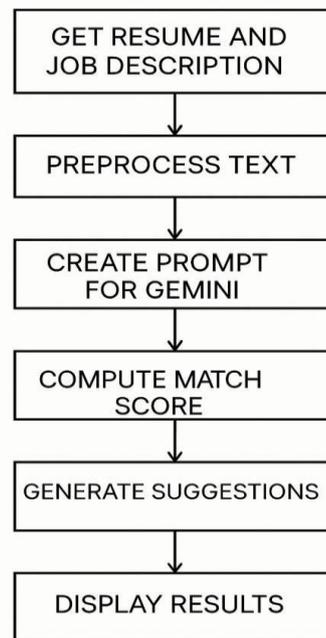


Fig. 1. Resume-Job Matching

B. Alogrithm 2: Skill Extraction and Comparison through Keyword Matching

This algorithm is designed to identify and analyze the skills listed in a candidate’s resume and compare them with those required in a job description, using a straightforward but effective keyword matching approach. It begins with a comprehensive, predefined list of essential and industry-relevant skills, such as Python, SQL, Excel, problem-solving, communication, and teamwork. When a resume is uploaded, the system scans the document to detect which of these key skills are mentioned, creating a personalized skill list from the content of the resume.

Simultaneously, the system analyzes the job description to extract the set of skills that the employer is looking for. It then performs a comparison between the two lists — one from the resume and the other from the job post — to identify matches, partial overlaps, and missing skills. This side-by-side comparison helps the system pinpoint any crucial skills that are absent from the resume but expected in the job role.

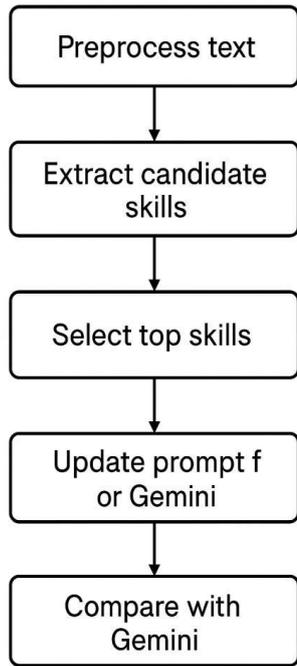


Fig. 2. Skill Extraction and Comparison through Keyword Matching

C. Algorithm 3: AI - Powered Resume Enhancement through Smart Suggestions

This personalized suggestions to help users strengthen their resumes after comparing them with a job description. By identifying missing elements and analyzing weak areas using Gemini’s advanced understanding, the system generates clear, actionable advice. Instead of vague feedback, it provides specific suggestions such as “Highlight your project work more clearly” or “Include details about teamwork or leadership experience.” The feedback is neatly organized into categories like skills, experience, and achievements, making it easy for users to follow. Combined with the match score, these insights transform the resume analyzer into a smart, supportive career assistant that helps users improve rather than just evaluate.

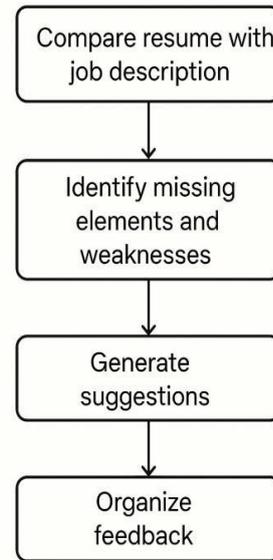


Fig. 3: AI-Powered Resume Enhancement through Smart Suggestions

Overall Flowchart

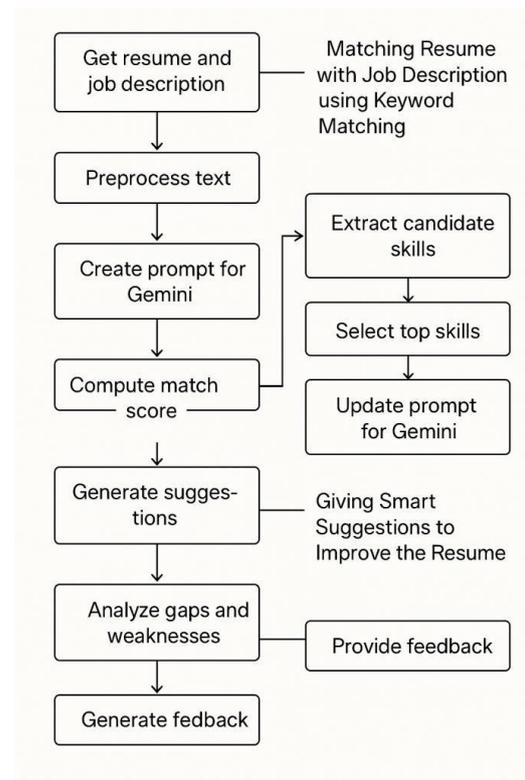


Fig. 4. Overall Flowchart

The result is not just a skill summary but a feedback mechanism that provides targeted advice. For example, the system might notify the user with suggestions like: “The job description lists SQL as a required skill, but it's not found in your resume —

consider including relevant experience or learning it if you haven't already." This enables job seekers to better align their resumes with specific job opportunities, improving their chances of catching a recruiter's eye.

The final flowchart visually represents the end-to-end process of the AI-powered resume analysis system. It begins with uploading the resume and job description, followed by a text preprocessing step that cleans and prepares both documents. From there, the process branches into two paths: one for matching the resume to the job description using Gemini AI, and the other for extracting and comparing skills through keyword matching. The insights from both paths feed into the final step, where the system generates smart suggestions to improve the resume. Each block is clearly labeled and connected with directional arrows, showing a smooth and logical flow from input to intelligent, actionable feedback.

IV. RESULT ANALYSIS

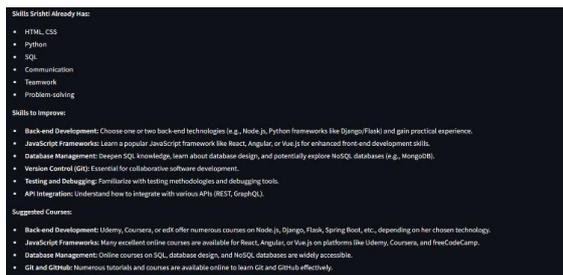


Fig. 6. screen shot of showing skills to improve and suggested course

The image shows a personalized resume analysis for Sriшти, highlighting her current strengths like HTML, Python, SQL, and soft skills. It also points out areas to improve such as backend development, JavaScript frameworks, and database management. Alongside this, it offers helpful course suggestions from platforms like Udemy and Coursera, making it easier for her to upskill and align her profile with job requirements.



Fig. 7. screen shot of showing strengths and weaknesses

The image provides a detailed resume review for Sriшти Sharma, focusing on her suitability for a Full Stack Web Developer role. It highlights her strengths like clear career goals, a relevant project, solid skills in Python and SQL, soft skills, and certifications. However, it also points out areas needing improvement such as limited experience, a narrow skillset, lack of project details, and the short length of her resume. The feedback offers constructive insights for improving her profile to better match industry expectations.



Fig. 8. Screenshot of overall assessment

The image presents the overall assessment of Sriшти Sharma's resume. While it shows promise, it lacks depth in project detail and relevant experience, making it less competitive for a Full Stack Web Developer role. The reviewer suggests she focus on improving her skills and completing meaningful projects. For now, she's better suited for internships or entry-level positions, especially in front-end development, until she builds a stronger portfolio.

V. CONCLUSION

This project focuses on revolutionizing the way job seekers build and refine their resumes by introducing intelligence and personalization into the process. Traditional resume scanners often rely solely on keyword matching, which can overlook the true value and context of a candidate's experience. Our Resume Analyzer goes beyond that — it uses Artificial Intelligence, specifically Natural Language Processing (NLP) and Google's Gemini AI, to deeply understand the content of a resume and intelligently compare it to the requirements of a specific job description.

Instead of simply grading resumes as good or bad, this tool provides a holistic evaluation. It identifies strengths, pinpoints weaknesses, and highlights exactly where the resume aligns or misaligns with the job criteria. It generates a match score, offering a clear metric for how well-suited the resume is for a given role. Even more importantly, it offers personalized feedback and actionable suggestions, such as improving project descriptions, adding missing technical skills, or refining the objective statement.

With this tool, users are empowered to continuously improve their resumes with clarity and purpose.

They're not just applying blindly — they're applying with confidence and insight. By helping job seekers tailor their resumes for each opportunity, this project serves as a smart assistant, effectively bringing them one step closer to landing their ideal job.

REFERENCES

- [1] ResumeAtlas. (2024). ResumeAtlas: Leveraging LLMs like Gemma1.1 and BERT for High-Accuracy Resume Classification. *arXiv preprint*, arXiv:2406.18125.
- [2] Sun, Y., Liu, Z., Ma, Y., & Zhao, W. (2023). Learning Document-Level Semantic Similarity for Resume and Job Description Matching. *Proceedings of the ACM Web Conference*.
- [3] Zhang, Z., Zhao, L., & Zheng, Y. (2019). End-to-End Neural Ranking for Resume-Job Matching with BERT. *arXiv preprint*, arXiv:1910.03089.
- [4] Patel, H., & Singh, R. (2023). Resume Parsing Across Multiple Job Domains Using a BERT-Based NER Model. *ResearchGate*.
- [5] Kaya, A., & Yılmaz, T. (2025). An Efficient Resume Filtering System Using NLP-Based Preprocessing and Similarity Scoring. *International Journal of Computer Applications and Information Technology*.
- [6] Mittal, R., & Jain, P. (2023). Resume Information Extraction from OCR Data Using NLP Techniques. *SSRN Electronic Journal*.
- [7] Rahman, M., & Chowdhury, T. (2023). An ML-Based Approach for Resume Classification and Domain Routing. *Journal of Information Systems and Telecommunication*, 11(4), 275–284.
- [8] Kumar, A., & Desai, R. (2025). AI-Driven Job Matching and Skill Recommendation System for Smart Hiring. *Procedia Computer Science*, 224, 554–562.
- [9] Pan, S. J., & Yang, Q. (2020). Fairness in Resume Screening: Reducing Bias with fair-tfidf. *UMBC NLP Lab*.
- [10] Sharma, M., & Gupta, D. (2023). Applying BERT-Based NLP for
- [11] Automated Resume Screening and Candidate Ranking. *ResearchGate*.