

AI-Powered Resume Evaluation System

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Abstract: *The contemporary job market is highly competitive, with Applicant Tracking Systems (ATS) functioning as the main tool for evaluating resumes.*

Although these systems are efficient, they often depend on strict keyword matching, which may not fully capture the meaning behind a candidate's experience. This paper introduces an intelligent framework intended to overcome this limitation by using the advanced natural language processing and generation abilities of Large Language Models (LLMs). Our system goes beyond basic resume parsing by extracting essential information from PDF resumes and offering a range of career improvement tools. These include a detailed ATS compatibility score with specific recommendations, recognition of skills that are currently popular and relevant to a candidate's background and desired positions, and tailored suggestions for professional certifications. By making use of the Mistral-7B-Instruct-v0.2 model through the Hugging Face Inference API, our framework offers a practical, easy-to-use, and effective method to support job seekers with insights that are backed by data, helping them make informed decisions about their careers.

Keywords: Large Language Models (LLMs), Mistral-7B, Resume Parsing, Applicant Tracking System (ATS), Prompt Engineering, Hugging Face API, Career Enhancement, Natural Language Understanding (NLU)

I. INTRODUCTION

The recruitment process has been significantly transformed by technology, with Applicant Tracking Systems (ATS) playing a central role. These systems automate the first stage of resume screening, which significantly reduces the time recruiters spend on initial evaluations. However, the algorithms used by these systems often rely on keyword-based searches, which can unintentionally reject qualified candidates whose resumes are not precisely aligned with the specific, pre-set terms used by employers. This poses a considerable challenge for job seekers, who must carefully customize their resumes for each application, frequently without clear direction. In addition, career development is an ongoing process. The skills required for certain roles are constantly changing due to technological progress. Job seekers need more than just a resume that is well-structured; they need guidance on how to stay competitive. This includes understanding the skills they currently lack, identifying new skills that are growing in demand within their industry, and obtaining certifications that can support their professional credibility. To tackle these issues, we suggest a comprehensive system that is powered by LLMs and extends beyond simple data extraction. Our framework is designed with four main goals. Intelligent Data Extraction: To correctly parse resumes in PDF format and extract structured data such as personal details, skills, and professional summaries. Advanced ATS Analysis: To deliver a thorough compatibility score through a comparison of a resume with a job description, giving in-depth feedback on keyword usage, experience relevance, and formatting. Proactive Skill Recommendation: To recognize and suggest emerging, high-demand skills based on the candidate's current skill set and career goals. Personalized Certification Guidance: To recommend widely recognized certifications that can fill skill gaps and strengthen a candidate's professional standing. This paper outlines the structure, methods, and implementation of our framework, demonstrating how modern LLMs can be applied to create a powerful tool for career guidance.



II. LITERATURE REVIEW

- [1] Jha,R.(2025): Designed an AIpowered resume builder that assists job seekers in organizing their resumes and emphasizing relevant skills. The system uses natural language processing to examine job descriptions and recommend the best places to include key terms in resumes. By matching resumes with Applicant Tracking Systems(ATS),the tool enhances the visibility of candidates and increases the chances of being shortlisted. The study also noted that AI helps reduce human errors in resume formatting and improves the overall quality of applications. This tool illustrates how AI can connect the experiences of job seekers with the needs of organization
- [2] Abhishek,K.L.(2025): Developed an intelligent resume screening tool that offers recommendations. The tool uses machine learning algorithms to assess resumes based on relevant skills, work experience and academic qualifications. Job seekers receive specific feedback, such as suggestions for skill improvement and ways to optimize keywords for better ATS rankings. The study found automating the resume screening process lowers recruiter bias and ensures a more consistent evaluation. It also showed that AI based advice can help candidates prepare better, resulting in a more efficient recruitment process.
- [3] Bevara,R.V.K.(2025): Introduced Resume2Vec, a framework that converts resumes into intelligent embeddings for semantic matching between candidates and job openings. Unlike traditional systems that rely on keywords, Resume2Vec captures the contextual and semantic connections between candidate skills and job requirements. These embeddings are processed using deep learning, allowing for accurate similarity scores between resumes and job descriptions. The results demonstrated significant improvements in candidate job alignment and faster short listing. This approach highlights AI's ability to understand candidate profiles a more comprehensive way rather than just matching keywords.
- [4] Deshmukh,A.(2025): Applied BERT based NLP models for automated resume screening and candidate ranking. The process involved finetuning transformer models to understand the meaning of skills, experience, and qualifications. The system ranks candidates based on their semantic relevance to job descriptions rather than just keyword matches. The experimental results indicated higher accuracy in candidate ranking and less time spent on manual evaluations. This research shows the growing importance of transformer based models in interpreting complex textual data during recruitment.
- [5] Giri,A.(2025): Explored AI powered student assessment systems, focusing on adaptive evaluation and personalized feedback. The study showed how AI can assess individual performance, find learning gaps, and offer actionable recommendations. While centered on educational assessments, the methodology is applicable to recruitment, where AI can predict candidate potential and fit. The research also highlighted how adaptive AI evaluation increases efficiency and fairness in large-scale assessments. It opens the possibility of using AI
- [6] Mujtaba,D.F.(2024): Examined fairness AI driven recruitment, addressing bias in algorithms, training data, and evaluation metrics. The study reviewed methods for measuring and reducing bias, including fairness aware learning techniques. It also stressed the need for ethical deployment frameworks to ensure AI recommendations are fair for all candidates. The authors noted that even advanced AI systems can reinforce unequal treatment not carefully managed. This research offers guidelines for organizations to use AI responsibly in hiring.
- [7] Koshti,H.(2024): Created an AI powered interview preparation system that combines resume analysis, HR simulations, and technical skill assessments. The system uses natural language processing and machine learning to evaluate resumes, generate interview questions, and assess technical abilities. The findings showed improved readiness and confidence among candidates, while recruiters benefited from more structured evaluations. The study emphasized the integration of multiple AI features into one platform, showing how integrated approaches can improve recruitment efficiency.
- [8] Sarveshwaran,R.(2024): Focused on NLP-based AI-driven resume screening, which extracts structured insights from unstructured resume data. The methodology involved parsing resumes, identifying key skill and experience patterns, and ranking candidates based on their semantic matching with job requirements. The research showed increased efficiency and accuracy in shortlisting compared to manual screening.



[9] Ashrafi,S.(2023): education systems that recommend career paths in fastchanging job markets.Using AI algorithms,the system identifies skill gaps, suggests learning opportunities,and guides candidates toward suitable roles. The research emphasizes thatAIcan support both recruitment and ongoing career development. Findings showed increased employability and adapt ability for candidates using the system. This study shows AI's role not just in selecting candidates but also in lifelong learning and skill improvement.

[10] Albassam,W.A.(2023): Conducted an analytical review ofAI recruitment strategies, looking at current practices, benefits,and challenges.The review showed the efficiency gains ofAI in screening and ranking candidates,while also pointing out ethical issues like bias and transparency. The study suggested ways for organizations to balance automation with human oversight. It provides a full understanding ofAI's potential and limitations in recruitment

[11] Hunkenschroer,A.L.(2022): Conducted a comprehensive review on the ethics of. AIenabled recruiting and selection, identifying risks such as algorithmic bias, lack of transparency, and accountability issues.The study stressed the need for frameworks that ensure fairness, interpretability, and compliance with ethical standards. It also proposed future research directions for developing responsible AI recruitment systems. This work sets the foundation for understanding the social and ethical implications of AI in talent acquisition.

III. PROPOSED METHODOLOGY

The framework is designed as a modular, multi-stage process that systematically converts unstructured resume content into structured, useful information. This approach emphasizes reliability, reproducibility, and accuracy, using advanced text processing and strategies for interacting with AI. It ensures that the data is clear and can be validated in a structured way. The whole process can be broken down as follows:

PDF Input → Stage 1: Text Extraction & Normalization → Clean Text Corpus → Stage 2: Task-Specific Prompt Formulation → Formatted Prompt → Stage 3: LLM Inference → Raw Response → Stage 4: Hierarchical Output Parsing → Structured Data Output → Stage 5: Insight Generation and Analysis

3.1. Stage 1: Data Preprocessing and Text Extraction

Dealing with resumes in PDF format is challenging because of how they are structured, often with inconsistent formatting and layout. This stage focuses on converting these documents into a readable text form while keeping the meaning intact. Document Parsing: Resumes are taken in, and all text is extracted. This process ensures that headers, bullet points, tables, and other formatting elements are recognized and ordered properly, so the information flows in a way that makes sense to a human reader. This setup is essential for the AI to understand the resume correctly. Text Normalization: The raw text might have extra spaces, line breaks, or other issues that make it hard for machines to process. So, a comprehensive normalization process is used to fix these issues, making the text uniform and easier to work with. The result is a clean text corpus that's ready for further AI processing, improving the chances of accurate results. Data Integrity Checks: The system checks if parts of the resume are missing or if there are any irregularities in the extracted content. It flags any incomplete resumes so that the analysis is only done on well-structured data. This step helps ensure the reliability of the final insights.

3.2. Stage 2: Core AI Interaction and Prompt Engineering

At the center of the framework is the AI-powered analysis stage where the unstructured resume text is transformed into clear, meaningful data.Model Selection:The framework uses an advanced instruction-tuned transformer model.This model is effective at understanding detailed instructions, reasoning with complex data, and generating results that follow strict formats. It balances strong performance with efficient computing, making it suitable for large- scale use through APIs.Prompt Engineering: For the AI to provide reliable results, it's important to design prompts clearly.This includes:Task Definition:The prompts tell the model exactly what it needs to do, like assessing how well a candidate fits a job, pulling out technical skills, or measuring how well a resume matches an ATS (Applicant Tracking System).Giving the model a professional persona helps it better understand and apply domain-specific knowledge.Output Schema Specification:The prompts also include examples of what the desired output should look



like, such as structured tables or detailed data schemas. This guides the model to generate output that's both easy for machines to read and logically correct.

3.3. Stage 3: Hierarchical Output Parsing and Error Handling

AI-generated responses can at times be inconsistent, include unnecessary text, or not follow the required format. A hierarchical parsing strategy is used to increase the reliability of structured data extraction:

Primary Parsing: The system first tries to interpret the AI response according to the defined format. If the output is clear and well-structured, it is directly converted into a useful format for further analysis.

Secondary Fallbacks: If primary parsing doesn't work, other methods are used to analyze the text, such as looking for patterns, nested structures, or recognizable data markers. This ensures that small formatting issues don't stop the system from delivering results.

Error Management and Logging: When parsing isn't possible, the raw output is saved and logged for review. This helps in continuously refining the prompts, schema definitions, and parsing strategies, maintaining system stability while supporting improvements to the model.

3.4. Stage 4: Insight Generation and Data Structuring

Once the data is structured, the framework moves on to creating useful insights:

Skill and Competency Mapping: The extracted data is analyzed to identify technical skills, soft skills, certifications, and levels of experience. This allows for an automated assessment of a candidate's strengths and areas where they may need growth.

ATS Compatibility Scoring: Resumes are evaluated against job descriptions to determine how well they match. This provides a compatibility score that highlights both matches and gaps in the candidate's qualifications.

Trend Analysis: When looking at multiple resumes, the system can identify trends such as commonly held skills, newly emerging abilities, or areas where candidates tend to fall short.

3.5. Stage 5: System Robustness and Scalability Considerations

The system is designed to handle diverse data sets with stability and scalability:

Modular Architecture: Each part of the process works independently, which means that any part can be adjusted, replaced, or enhanced without affecting the rest of the system.

Scalability: The system is built to process many resumes at once, using parallel AI interactions and efficient handling of data. This makes it suitable for large-scale applications.

Quality Assurance: Automated checks are in place to catch issues such as incomplete data or inconsistencies, ensuring high-quality results even when processing large volumes.

Extensibility: The pipeline can be expanded to support different languages, more detailed skill categories, or integration with HR systems without needing a complete redesign of the framework. This multi-stage approach ensures that unstructured resumes are turned into structured, actionable insights.

By combining advanced text processing, thoughtful AI interaction, and strong error-handling mechanisms, the framework offers a reliable solution for career guidance, recruitment analytics assessment.



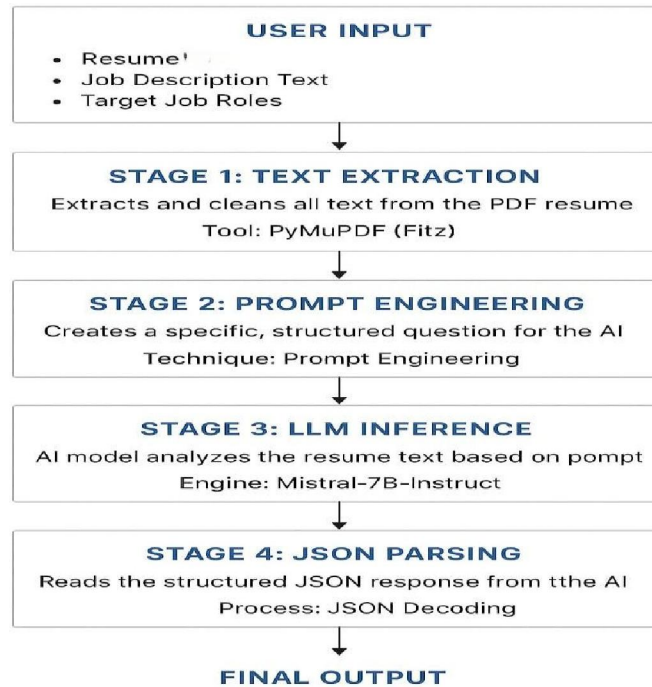
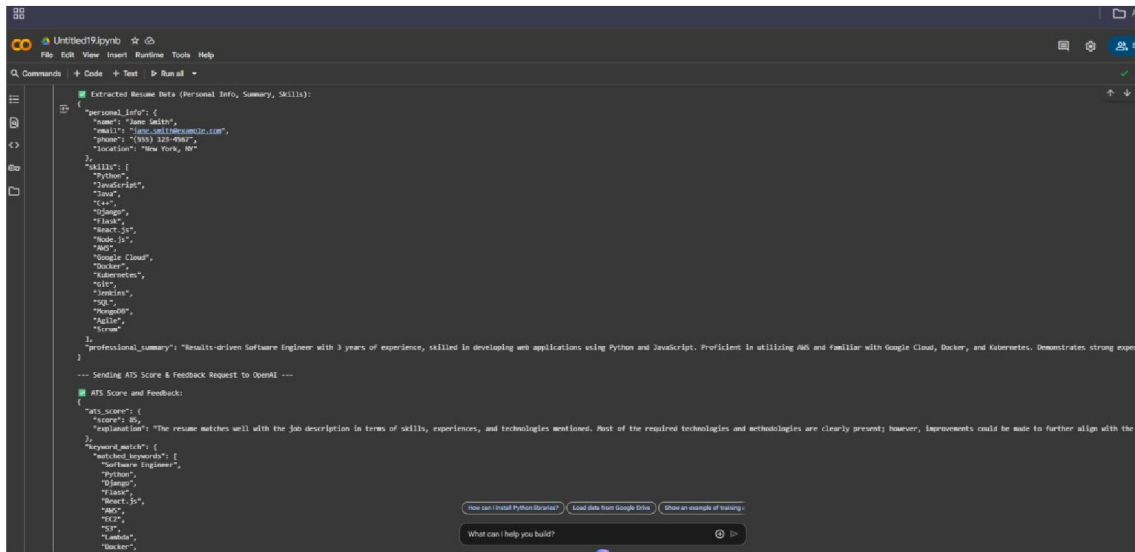


Fig: AI-Powered Resume Evaluation System

Output:

The final output synthesizes data from resume extraction and job description analysis to generate a personalized career development roadmap, providing the user with actionable recommendations for skill acquisition and certification



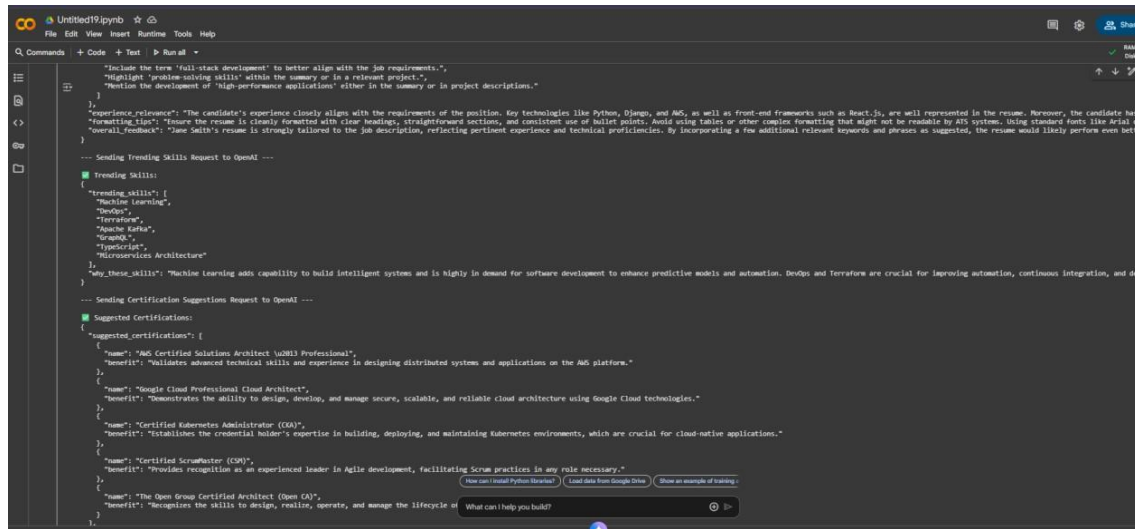
```

Extracted Resume Data (Personal Info, Summary, Skills):
{
  "personal_info": {
    "name": "Jane Smith",
    "email": "jane.smith@example.com",
    "phone": "(913) 555-0000",
    "location": "New York, NY"
  },
  "skills": [
    "Python",
    "JavaScript",
    "Java",
    "C++",
    "GoLang",
    "React.js",
    "Node.js",
    "AWS",
    "Google Cloud",
    "Docker",
    "Kubernetes",
    "Git",
    "Spring",
    "JSP",
    "PHP",
    "MySQL",
    "Agile",
    "Team"
  ]
},
"professional_summary": "Results-driven Software Engineer with 3 years of experience, skilled in developing web applications using Python and JavaScript. Proficient in utilizing AWS and familiar with Google Cloud, Docker, and Kubernetes. Demonstrates strong expertise in..."

--- Sending ATS Score & Feedback Request to OpenAI ---

ATS Score and Feedback:
{
  "ats_score": 85,
  "score": 85,
  "explanation": "The resume matches well with the job description in terms of skills, experiences, and technologies mentioned. Most of the required technologies and methodologies are clearly present; however, improvements could be made to further align with the..."
},
"keyword_match": {
  "matched_keywords": [
    "Software Engineer",
    "Python",
    "JavaScript",
    "GoLang",
    "React.js",
    "Node.js",
    "AWS",
    "Git",
    "Spring",
    "JSP",
    "PHP",
    "MySQL",
    "Docker",
    "Kubernetes"
  ]
}
  
```





```

{
  "experience_relevance": "The candidate's experience closely aligns with the requirements of the position. Key technologies like Python, Django, and AWS, as well as front-end frameworks such as React.js, are well represented in the resume. Moreover, the candidate has",
  "formatting_tips": "Ensure the resume is cleanly formatted with clear headings, straightforward sections, and consistent use of bullet points. Avoid using tables or other complex formatting that might not be readable by ATS systems. Using standard fonts like Arial or",
  "overall_feedback": "Tane Selva's resume is strongly tailored to the job description, reflecting pertinent experience and technical proficiencies. By incorporating a few additional relevant keywords and phrases as suggested, the resume would likely perform even better."
}

--- Sending Trending Skills Request to OpenAI ---

{
  "trending_skills": [
    {
      "skill": "Machine Learning",
      "description": "Machine Learning",
      "importance": "High",
      "related_skills": [
        "Python",
        "Django",
        "React.js",
        "AWS",
        "TensorFlow",
        "Kubernetes",
        "Microservices Architecture"
      ]
    }
  ],
  "why_these_skills": "Machine Learning adds capability to build intelligent systems and is highly in demand for software development to enhance predictive models and automation. DevOps and Terraform are crucial for improving automation, continuous integration, and deli"
}

--- Sending Certification Suggestions Request to OpenAI ---

{
  "suggested_certifications": [
    {
      "name": "AWS Certified Solutions Architect (SAA) Professional",
      "benefit": "Validates advanced technical skills and experience in designing distributed systems and applications on the AWS platform."
    },
    {
      "name": "Google Cloud Professional Cloud Architect",
      "benefit": "Demonstrates the ability to design, develop, and manage secure, scalable, and reliable cloud architecture using Google Cloud technologies."
    },
    {
      "name": "Certified Kubernetes Administrator (CKA)",
      "benefit": "Establishes the credential holder's expertise in building, deploying, and maintaining Kubernetes environments, which are crucial for cloud-native applications."
    },
    {
      "name": "Certified ScrumMaster (CSM)",
      "benefit": "Provides recognition as an experienced leader in Agile development, facilitating Scrum practices in any role necessary."
    },
    {
      "name": "The Open Group Certified Architect (Open CA)",
      "benefit": "Recognizes the skills to design, realize, operate, and manage the lifecycle of"
    }
  ]
}

```

IV. CONCLUSION

The findings from our case study demonstrate that the system is capable of providing accurate, context-aware, and useful advice in various aspects of career development, including improving resumes for automated screening systems and planning skills for the long term. By moving beyond basic keyword-based methods, the framework shows how large language models can understand complex professional backgrounds and offer tailored suggestions that match an individual's strengths, career goals, and industry needs. This not only helps candidates present themselves more effectively to employers but also encourages thoughtful consideration of skill development and career growth.

Despite some limitations, such as reliance on the foundational language models, potential for bias in training data, and the difficulty of keeping information current, the framework acts as a strong demonstration of AI-based career support systems.

Importantly, even smaller and more affordable models like Mistral-7B-Instruct-v0.2 have proven that complex tasks, such as resume analysis, identifying skill gaps, and offering practical career advice, can be handled efficiently when paired with well-crafted prompts and organized output processing. This presents opportunities for affordable, widely applicable AI tools that are accessible to a broader audience, including those in less-resourced settings.

Looking ahead, there is considerable potential for improving this framework.

Future work could involve fine-tuning the system for specific fields to increase accuracy, integrating up-to-date labor market data to offer timely advice, and improving the user interface to make the system more user-friendly and engaging. Beyond technical enhancements, adding features like mentorship connections, career path forecasting, and customized learning resource recommendations could transform the framework into a full-fledged career development platform.

In the end, this project illustrates the powerful role AI can play in making career support more accessible to everyone. By offering individuals personalized, evidence-based guidance, these systems can decrease inequalities in professional support, support better decision-making, and encourage continuous learning. In a quickly changing and increasingly automated job market, intelligent systems like this one can help create a fairer and more competitive environment, allowing people to confidently and strategically manage their career paths.

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