

RezSearch: AI-driven Resume Parser

Varenya Vinay
Dept of Big Data Analytics
St. Aloysius College (Autonomous)
Mangalore, India
varenayav2000@gmail.com

Wincel Glany Pais
Dept of Big Data Analytics
St. Aloysius College (Autonomous)
Mangalore, India
wincelpais@gmail.com

Abstract— In the rapidly evolving landscape of recruitment, "RezSearch" emerges as a pioneering AI-driven resume parser, poised to revolutionize candidate evaluation processes. The core feature of RezSearch centres on its innovative AI technology, designed to extract pivotal information from diverse resumes efficiently. This novel approach expedites candidate screening, enabling recruiters to focus on core qualifications swiftly and effectively. RezSearch's integrated functionalities transcend traditional parsing methods. The system provides a comprehensive overview of each candidate's profile by categorizing critical resume components such as contact details, skills, education, work history, and certifications. Accurate data extraction and processing is ensured by the systematic organization in conjunction with the OpenAI API. The incorporation of OpenAI's capabilities elevates RezSearch's language understanding, enabling it to decipher nuances within resumes of varying formats and complexities. A standout aspect of RezSearch lies in its commitment to user-centric design. The software presents a user-friendly interface that simplifies the parsing experience. Recruiters can navigate through parsed data effortlessly, swiftly evaluating candidates and making informed decisions. In conclusion, RezSearch amalgamates cutting-edge AI capabilities, advanced libraries, and an intuitive interface, presenting a dynamic solution that redefines resume parsing and ultimately enhances the recruitment process.

Keywords— *rezSearch, OpenAI, resume, AI.*

I. INTRODUCTION

The rise of AI technology has brought about substantial transformations in a variety of industries, including recruitment [1]. Traditionally, screening job applications has been a time-consuming and frequently biased manual process in which recruiters methodically study and evaluate resumes to locate eligible individuals [2]. This manual approach is prone to errors and partiality, resulting in hiring inefficiencies [3].

Recognizing the need for a more efficient and objective solution, the development of an automated intelligent system becomes imperative. A system of this type should be able to extract critical information from unstructured resumes and transform it into a uniform, structured format that can be easily sorted and matched to specific employment opportunities [4]. Also, a system which can interact with the user and help find job openings and match them with a prospective candidate based on the description provided by the user [5]. This shift from manual to automated processes is critical for increasing the efficiency and fairness of the hiring process.

In response to these challenges, RezSearch emerges as a groundbreaking solution that leverages state-of-the-art AI tools and techniques to streamline job finding, resume parsing and skill extraction with a high degree of accuracy. This invention is an important step toward making the hiring process more efficient and bias-free.

RezSearch is a cutting-edge service that uses artificial intelligence to revolutionize the recruitment process. It tackles important industry difficulties by automating resume processing, precisely extracting talents, and facilitating smooth job matching. This paper presents and expands on RezSearch's features, emphasizing its potential to streamline job search and recruitment procedures for both job seekers and job providers.

II. PROBLEM STATEMENT

Job seekers face challenges finding suitable employment opportunities, while employers struggle to identify qualified candidates. The traditional process of matching resumes to job descriptions is time-consuming and prone to bias. An innovative AI solution can streamline the job-seeking process and improve the accuracy of identifying resumes that align with job postings, enhancing the recruitment ecosystem.

III. MATERIALS AND METHODS

RezSearch was created with great attention to detail and creative thinking, relying on a strong foundation of tools and techniques to guarantee its efficacy and dependability. The resources included state-of-the-art AI tools, cutting-edge libraries, and sophisticated algorithms that served as the framework for RezSearch's intelligent system.

Methodologically, a combination of web scraping techniques was employed to gather real-time job data, while the integration of API keys facilitated seamless access to external resume information, enhancing the system's database. Additionally, RezSearch utilized prompting approaches, leveraging natural language processing capabilities, to enhance user interactions and refine data extraction processes.

A. Fundamental Framework

RezSearch's underlying fundamental and central architecture is shown in the design presented in Fig. 1.

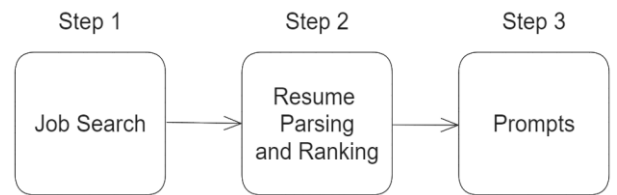


Fig. 1. Basic architecture of RezSearch

1) *Step 1:* RezSearch enables users to search for job opportunities that are available on Google Jobs by specifying job titles, locations, or other preferences. It returns matching job listings, allowing users to view and apply for positions [6]. Additionally, RezSearch integrates with LinkedIn, aiding employers in identifying candidates with desired skills by extracting relevant details from LinkedIn profiles [7]. This benefits both job seekers and employers. For job seekers, it provides a convenient way to search for and apply for jobs,

as well as a way to have their skills and experience seen by potential employers. For employers, it provides a way to quickly and easily identify qualified candidates for their open positions [8].

2) *Step 2:* Once RezSearch has identified qualified candidates, it extracts and identifies relevant skills from their resumes [9]. These extracted key skills are subsequently stored in a database. After parsing the resumes and storing this information in the database, the ranking of these resumes is conducted [10]. The ranking process involves evaluating and comparing the qualifications, skills, and experience presented in different resumes to determine their relative suitability for specific job openings. This helps employers to prioritize candidates who best match the job requirements, making the talent selection process more efficient and informed.

3) *Step 3:* RezSearch employs the PandasAI package to extract essential resume details through interactive prompts, utilizing natural language processing for real-time data conversations. Users can query various aspects of a resume, like a candidate's skills or educational background, and receive immediate responses based on their prompts. For example, one can ask PandasAI to identify candidates with specific skills or those who've worked on similar projects. This approach significantly enhances candidate screening efficiency for employers, allowing them to select individuals with the highest potential for success in their respective roles.

B. Model

RezSearch employs the GPT-3.5 Turbo language model to achieve precise data extraction from resumes, enhancing its capabilities through OpenAI API keys [11]. Because OpenAI's language model writes human-like text, having been trained on massive amounts of data [12]. The majority of RezSearch's capabilities, including resume parsing and prompting, are built on the OpenAI APIs model GPT-3.5 Turbo. Utilizing the OpenAI API, RezSearch seamlessly accepts textual input requests from users. These requests undergo a sophisticated parsing mechanism, which is applied comprehensively to the content of resumes. Subsequently, responses are diligently generated, guided by the prompts provided by users [13]. This integrated approach empowers RezSearch users with a professional-grade solution for extracting, parsing, and comprehending resume data with high precision, thereby optimizing the efficiency of data-driven decision-making in recruitment and beyond.

C. Components

1) *Job Search Implementation:* The first component of RezSearch is Job Search, which scrapes the Google job portals using BeautifulSoup and Selenium to extract attributes such as job role, location, and company for open positions. This data is then integrated with the LinkedIn portal to search for suitable candidates with the skillset that the company needs. Once a list of candidates has been identified, RezSearch uses OpenAI API keys to scrape their LinkedIn profiles for information such as name, title, company, location, skills, and experience. Once all of the data has been collected, RezSearch provides companies with a list of qualified candidates for their open positions. Companies can then filter and sort the list based on their specific needs

and criteria, empowering them with a tailored approach to candidate selection.

2) *Resume Parsing and Ranking:* The next component of RezSearch is Resume Parsing and Ranking, which takes the resumes from the candidates and extracts and identifies relevant skills from the provided documents done by the OpenAI keys API. The extraction process scans the uploaded resumes for key skills and presents them in a clear and organized manner, making it easier for employers to identify candidates with the desired qualifications. After extracting the key skills from the uploaded resumes these skills are then stored in a database using the package called mysql-connector-python where the parser can establish a connection to a MySQL database and efficiently store and retrieve resume data [14]. After parsing the resumes of the candidates and storing this information in the database, the ranking of these resumes is done based on the skills stored in the database. This is done by using a Fuzzy Wuzzy algorithm which uses Levenshtein distance to find approximate string matches. The process involves evaluating and comparing the qualifications, skills, and experience presented in different resumes to determine their relative suitability for specific job openings [15]. By ranking resumes, employers can effectively prioritize candidates who best match the job requirements, making the talent selection process more efficient and informed.

3) *Querying Information with Simple Prompts:* The last component of RezSearch is utilizing the prompts to extract important information from the resumes. This is done by using the PandasAI package. PandasAI uses natural language processing to conduct real-time chats with data, allowing users to ask questions about resumes in natural language. This means that a user can ask PandasAI questions about a resume, such as the skills the candidate possesses, their educational qualifications etc. PandasAI will then use its AI capabilities to generate a response to the prompt a user provides. This approach helps employers to filter through the candidate pool more efficiently and select candidates with the greatest potential to succeed in their respective roles. For example, an employer could ask PandasAI to identify candidates with a specific combination of skills and experience or to identify candidates who have worked on similar projects. By providing a deeper analysis of candidates who meet these criteria, employers gain valuable insights into potential candidates' qualifications and strengths. This approach helps employers to make more informed hiring decisions and to build a stronger workforce.

D. Workflow

The RezSearch Architecture is meticulously displayed in Fig. 2., which shows the system's underlying structure and the relationships between its various components. It provides an in-depth understanding of the system's fundamental architecture and highlights its essential features. The illustration depicts how RezSearch performs activities ranging from resume processing to candidate-job matching.

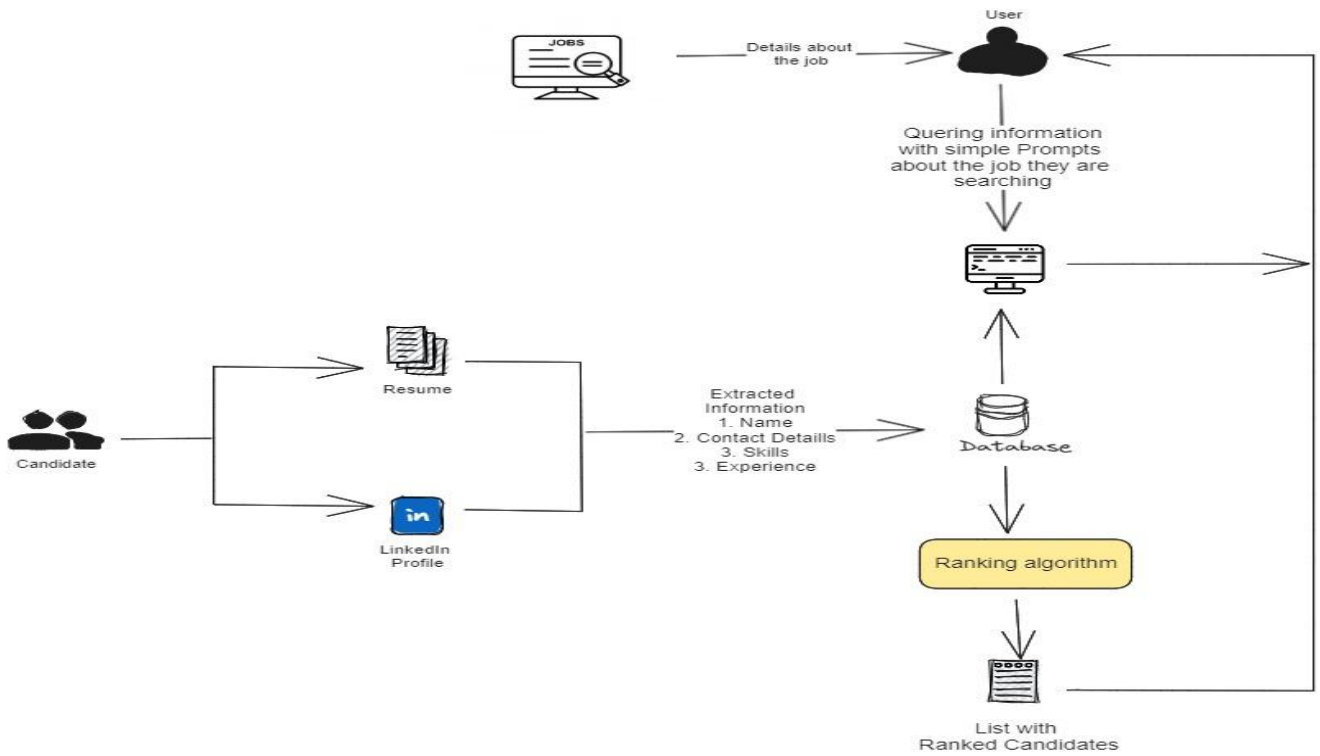


Fig. 2. RezSearch Architecture

IV. RESULTS

The outcomes of RezSearch's resume processing and candidate-job matching capabilities are convincing. It expedites prospect screening through automation, allowing recruiters to concentrate on key criteria quickly. By using OpenAI's language comprehension, the recruiting process is streamlined, saving time for both job searchers and recruiters.

A. Job Search Efficiency

RezSearch's web-based Job Search was created using web scraping to extract KPIs on the number of jobs available in the market, the various positions available, the location, and the company name. When analyzing its performance on Google Jobs, it accurately extracted the following data.

The details include,

- Number of Jobs Available
- Available Job Roles
- Location
- Company Name

B. Resume Parser Performance

RezSearch was evaluated on a diverse set of 100 resumes with different formats and structures. The test results indicated that it was highly successful in accurately extracting vital information from a significant majority of the resumes. Specifically, RezSearch was able to extract key data from over 95% of the resumes, achieving an impressive level of accuracy. This was due to the OpenAI 3.5 turbo model, which assisted in extracting information from resumes.

The key details include,

- Name
- Contact Details
- Education
- Work Experience
- Skills

C. RezSearch Prompt

While analysing the performance of RezSearch's prompting tool. It displayed resumes that matched the user's queries from the resumes that were submitted and saved in the database. The performance was 90% accurate, however, if there were fewer resumes saved in the database, some incorrect results would be displayed. Inaccurate results would be displayed by RezSearch's prompting tool when the user prompts were not understandable.

V. DISCUSSION

The results presented in this report demonstrate how RezSearch is a reliable and effective solution for overcoming significant challenges in the hiring process. The system seamlessly integrates job searching, resume parsing, and skill extraction, offering a comprehensive solution for both job seekers and recruiters. This is achieved using web scraping, API keys, and prompting approaches, which work together to improve the user experience and speed up the hiring procedure. The system provides job seekers and recruiters with a complete solution. With its user-friendly web interface, RezSearch has the potential to transform and improve the employment and recruiting industry. However, it is important to note that continuous improvements and changes will be necessary to keep up with the rapid development of technology and changing hiring requirements.

VI. CONCLUSION

RezSearch's innovative approach to resume parsing and candidate evaluation represents a significant breakthrough in the recruitment industry. It offers a dynamic solution, leveraging cutting-edge AI technology and advanced libraries to streamline the recruitment process. Its user-centric design enhances usability, making it a valuable tool for both job seekers and recruiters. Overall, RezSearch simplifies and improves the efficiency of recruitment procedures. By automating the resume parsing process, RezSearch expedites candidate screening, enabling recruiters to focus on core qualifications swiftly and effectively. The incorporation of OpenAI's language understanding elevates RezSearch's capabilities, enabling it to extract pivotal information from diverse resumes accurately. In conclusion, RezSearch represents a paradigm shift in the recruitment landscape, harnessing the power of AI to bridge the gap between job seekers and employers.

VII. FUTURE SCOPE

The future scope of RezSearch is promising as it is continuously seeking ways to improve and grow. One potential area of improvement is the implementation of a real-time notification system for candidates and job seekers. This system would enhance user engagement and provide timely updates on job opportunities. Furthermore, employing more advanced Large Language Models (LLMs) can considerably improve resume parsing accuracy, assuring precise information extraction; it can also be utilized for resumes in different languages. These exciting developments will position RezSearch as a more dynamic and effective tool in the job search and recruitment ecosystem, providing both candidates and employers with a streamlined and efficient experience.

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