



AI-Powered Career assistance system using intelligent feedback & ATS optimization

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ABSTRACT

JobNexus-AI is an intelligent AI-driven career platform that automates resume creation, analysis, job matching, and interview preparation. It employs frameworks like FastAPI, React, and OpenAI APIs for efficient processing and ATS-optimized resume generation. The system compares candidate skills with job requirements through embeddings, delivers AI-based feedback, and securely manages data with structured databases and vector stores. Overall, it enhances employability by minimizing manual effort and providing personalized, data-driven job-readiness solutions.

KEYWORDS : Artificial Intelligence (AI); Resume Analysis; Job Matching; Interview Coaching; Machine Learning; Career Assistance System.

1. INTRODUCTION

In the modern recruitment ecosystem, technology plays a crucial role in bridging the gap between job seekers and employers. The growing use of Artificial Intelligence (AI) has transformed how candidates create, analyse, and optimize resumes. However, many applicants still struggle to craft professional documents that meet the expectations of Applicant Tracking Systems (ATS) and hiring managers. This challenge emphasizes the need for a system that can guide users through every stage of job preparation efficiently. JobNexus-AI addresses this need by automating resume generation, analysis, job matching, and interview practice.

Artificial Intelligence has emerged as a vital tool in enhancing employability and simplifying recruitment processes. By applying intelligent techniques, AI systems can understand user inputs, analyse language structure, and generate human-like text with contextual relevance. JobNexus-AI utilizes these advancements to assist candidates in producing ATS-friendly resumes, analysing document quality, and identifying missing skills. Furthermore, it ensures that users receive personalized recommendations, improving their overall job readiness.

Another critical aspect of the job search process is aligning candidate profiles with relevant job descriptions. Manual comparison is time-consuming and often leads to missed opportunities. JobNexus-AI introduces an intelligent job-matching module that uses semantic similarity and embedding-based analysis to connect users with suitable roles. It measures how closely a resume aligns with job requirements while highlighting skill gaps and suggesting appropriate training.

In addition to resume enhancement and job alignment, interview preparation is an essential step toward employment success. JobNexus-AI incorporates an AI-powered Interview Coach that simulates real-time question-answer sessions. It evaluates responses based on clarity, confidence, and relevance, providing constructive feedback for improvement. This feature helps users gain confidence, refine communication, and prepare effectively for real interviews. Overall, JobNexus-AI represents a comprehensive solution that merges AI-driven intelligence with user-centric design to revolutionize job preparation.

2. MATERIALS AND METHODS

Stage 1: Project Planning

This stage involved defining the project objectives, identifying user needs, and dividing the system into modules such as the Resume Builder, Analyzer, Job Matcher, and Interview Coach. Agile methodology was adopted to ensure flexibility and iterative testing. A development roadmap, workflow chart, and technology selection plan were also finalized to guide systematic implementation.

Stage 2: Data Gathering and Analysis

Relevant data such as resume samples, job descriptions, and interview questions were collected and analysed. AI tools like SpaCy and NLTK were used for text processing, skill extraction, and keyword identification. Data cleaning and preprocessing ensured high-quality inputs for model training and similarity analysis. These insights supported the design of core algorithms for ATS scoring and job matching.

Stage 3: Research on Existing Similar Systems

Existing AI-based platforms such as Job scan and Rezi were studied to understand their features and limitations. Most systems focused on individual tasks rather than a complete job-preparation solution. This research revealed the need for an integrated platform that combines resume generation, analysis, job matching, and interview coaching — forming the foundation for JobNexus-AI's design.

Stage 4: Drafting the Main Components of the System

Each system module was drafted with clear functionality and data flow. The Resume Builder generates content using AI prompts, while the Analyzer evaluates structure and keywords. The Job Matcher applies vector embeddings for similarity checks, and the Interview Coach simulates AI-driven practice sessions. These components were interconnected through a unified backend for smooth integration.

Stage 5: Develop System Architecture

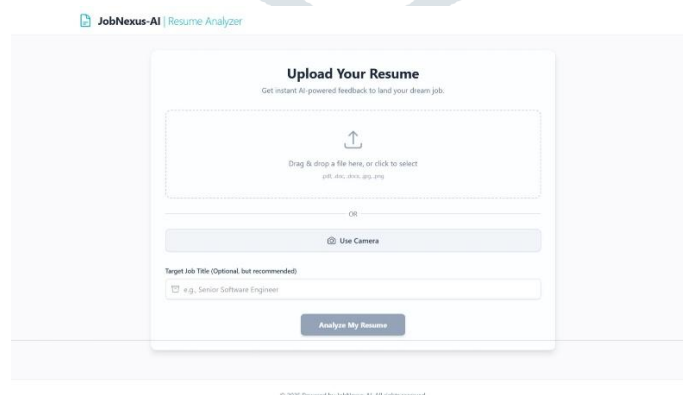
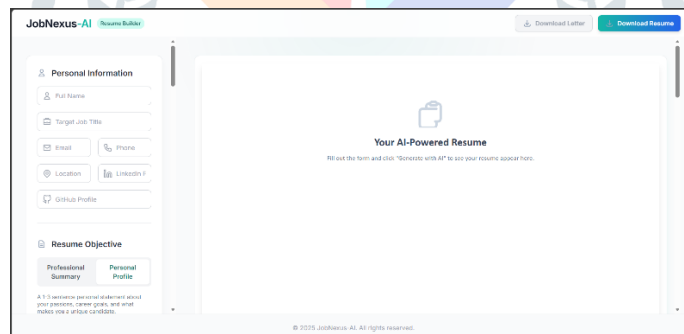
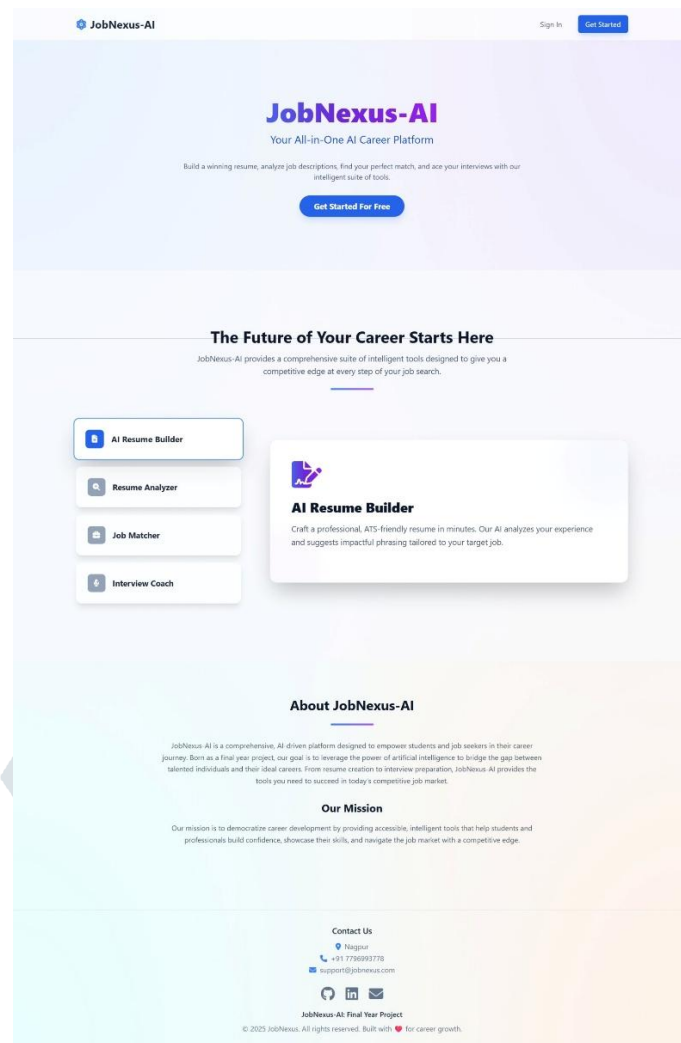
The overall architecture was developed using React and Tailwind CSS for the frontend and FastAPI / Node.js for backend APIs. Functions were implemented with SpaCy and OpenAI APIs. MongoDB handled data storage, while Pinecone managed vector embeddings. The design focused on scalability, modularity, and secure data communication.

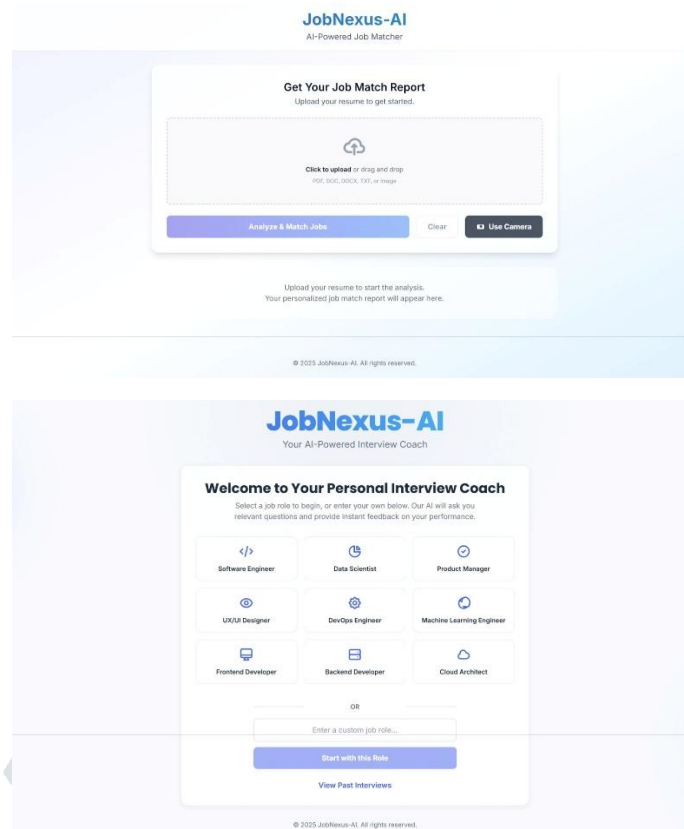
3. RESULTS

The implementation of JobNexus-AI successfully produced a functional and integrated platform combining resume generation, analysis, job matching, and interview coaching in one system. The AI Resume Builder generated professional, ATS-compliant resumes with accurate formatting and keyword optimization. The Resume Analyzer provided detailed feedback on grammar, readability, and skill alignment, helping users improve document quality.

The Job Matcher effectively measured the similarity between resumes and job descriptions using semantic embeddings, achieving high relevance in job recommendations. The Interview Coach

simulated real-time mock interviews, evaluated responses, and offered constructive feedback on clarity and confidence. System testing confirmed smooth communication between modules, efficient response times, and user-friendly interaction. The project demonstrated that AI-based automation can significantly enhance job-preparation efficiency, accuracy, and user satisfaction.





4. DISCUSSION

The development and evaluation of JobNexus-AI demonstrate the practical potential of integrating Artificial Intelligence in career development systems. The platform effectively automates multiple stages of job preparation, reducing manual effort while improving the quality and relevance of resumes and interview performance. Results indicate that AI-generated resumes align better with ATS requirements, and semantic job matching enhances candidate-job compatibility. The inclusion of an interactive interview coach further personalizes the user experience, providing immediate and constructive feedback. Overall, the system proves that intelligent automation can create a more efficient, data-driven, and accessible approach to employability and recruitment processes.

5. CONCLUSION

The JobNexus-AI system successfully integrates Artificial Intelligence to streamline and enhance the job-preparation process. By combining resume building, analysis, job matching, and interview coaching into a single intelligent platform, it addresses major challenges faced by job seekers in today's competitive market. The project demonstrates that automation and semantic understanding can significantly improve the efficiency, accuracy, and personalization of career-development tools. Through intelligent feedback, ATS optimization, and real-time interaction, JobNexus-AI empowers users to present their profiles more effectively and prepare confidently for recruitment processes. The system not only proves the effectiveness of AI in employability enhancement but also lays the foundation for future research and expansion in AI-driven career assistance systems.

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