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Multi-Agent Personalized Interview Coach: An AI-Powered Platform for Career Readiness

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Abstract
Now that so many people are looking for work, it is more difficult to prepare for an interview. When it comes to preparing, personalizing resumes, and locating authentic practice opportunities, students and recent graduates have a lot of work ahead of them. The fact that current resources are dispersed across several platforms causes inefficiencies, a lack of confidence, and less than ideal outcomes. To bridge this gap, we developed a Multi-Agent Personalized Interview Coach, an AI-powered platform that integrates practice interviews, resume writing, job search, and personalized education. The system uses voice recognition, Natural Language Processing (NLP), Large Language Models (LLMs), and 3D conversational avatars to help people prepare for their careers from beginning to end. Based on a multi-agent model, the design assigns each agent a specific task, such as learning, creating a resume, matching jobs, emulating interviews, and monitoring performance. The platform speeds up the job application process, increases candidates' confidence, and improves JD alignment, according to the results. By promoting inclusive education, improving employability, and encouraging technological innovation, this study advances the Sustainable Development Goals (SDGs 4, 8, and 9).

Keywords: *Career Counseling; Interview Simulation; Multi-Agent Systems; Resume Optimization.*

1. Introduction
Students and professionals are faced with a significant obstacle in locating the appropriate job opportunity in today's job market [1]. To succeed, candidates must possess strong knowledge of their chosen field and essential soft skills like effective communication, problem-solving, and presentation. The rise of fields like information technology, data science, artificial intelligence, machine learning, and software development often leaves candidates unprepared despite the potential for success in traditional preparation methods. Many job boards, mock interview services and websites - from online recruiters to resume builders to coding sites – are impersonal advice. Due to the absence of integration, candidates are unable to receive full support during their career preparation, leading to confusion and inefficiency. A recent study reveals that receiving tailored and real-time feedback significantly improves a candidate's confidence and job performance during interviews [2]. Yet many job seekers are deprived of these adaptive learning tools, as personalized coaching is usually limited to costly professional training programs. Why? A centralized system that employs AI and provides personalized job preparation guidance is becoming more popular due to the need for affordable solutions. This issue has become urgent. This research presents the Multi-Agent Personalized Interview Coach, a new framework that incorporates recent advances in speech processing, large language models (like many

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others), and generative AI/NLP. It functions as a comprehensive preparation platform, facilitating the seamless transition of candidates from preparation to placement.' It evaluates technical and behavioral responses, offering valuable insights into improvement through tailored feedback, context-aware coaching, and multi-modal interaction. With this framework, a variety of career readiness elements are combined to provide quality preparation materials so that the candidate can approach interviews confidently and get job offers [3].

2. Methodology

The system combines all the aspects of interview preparation into one framework, including resume analysis, adaptive learning, job discovery, mock interview simulation, and progress tracking [4]. Additionally, it can be used as a "one-stop" solution for candidates seeking to prepare for interviews. Advanced natural language processing methods are employed to optimize resumes.' It uses a system called Named Entity Recognition (NER) and cosine similarity, as well as automatic skill extraction to analyse resumes and compare them with job descriptions. It scrutinizes job postings to identify essential proficiencies and identifies areas where the candidate's profile requires improvement. These insights are then used in a large language model to suggest content rewrites that better fit the job requirements and improve compatibility with ATS [5]. Once the resume has been optimized, an interactive learning assistant is utilized by this system to reinforce knowledge. The GPT-based model generates practice questions that are topic-specific and adapted to actual interview situations. The difficulty of quizzes is adjusted to match the candidate's performance, which is continuously monitored to ensure consistent learning. ie. Whenever candidates make mistakes, the assistant provides detailed explanations to help them grasp their errors and improve. Through this adaptive approach, the candidate is given a personalized learning path that develops in line with their abilities. Using web scraping and API integrations, the system gather real-time job postings from various platforms to simplify job discovery. Through content-based filtering, a recommendation engine evaluates user preferences by comparing applicant skills with job descriptions. This ensures that opportunities are relevant and tailored to individual career goals.' The. A quick-apply feature is included, which generates personalized resumes for each application and simplifies the process [6]. This feature reduces the amount of work required for candidates and improves job targeting accuracy.' To help candidates prepare for real interviews, the system includes a mock interview module that is voice-based. At first, candidate's responses are captured and recorded in the Whisper speech-to-text model.' These transcripts are assessed by an LLM on the basis of their relevance, clarity, and confidence. Conversations can be synchronized through TalkingHead and other avatar systems, as well as text-to-speech technologies like Coqui TTS or Google TAS, which produce interviewer voices for a more immersive experience. The LiveKit app enables real-time audio and video chats, providing a more immersive experience similar to that of seasoned interviews. Finally, the system includes a detailed analytics and progress tracking module to provide measurable insights into candidate readiness [7]. Interactive dashboards are designed to continuously collect and present performance data, including quiz results, interview scores, and resume-job match scores.

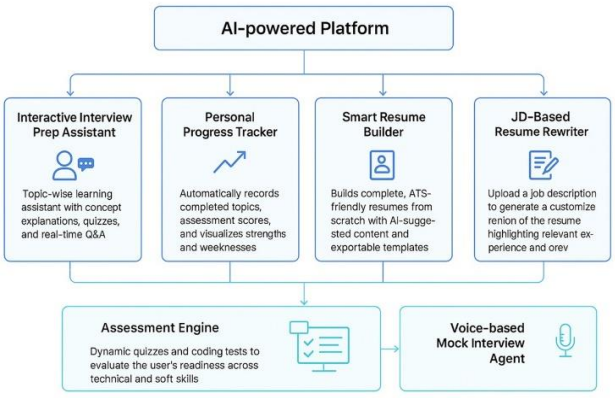

Figure 1 Architecture Diagram

By utilizing visual aids, such as progress reports, skill gap graphs and readiness percentages to track their development over time are available to candidates

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(Figure 1). Furthermore, it generates practical insights that inform preparation plans, ensuring that users are given personalized recommendations for improvement [8]. A system that combines data-driven analytics, job matching techniques such as resume optimization and adaptive learning, with realistic mock interviews to provide comprehensive interview preparation is now being considered. The proposal. This modular yet inter-related design provides candidates with transparency, flexibility and practical applications in a competitive job market [9].

3. Results and Discussion

3.1.Results

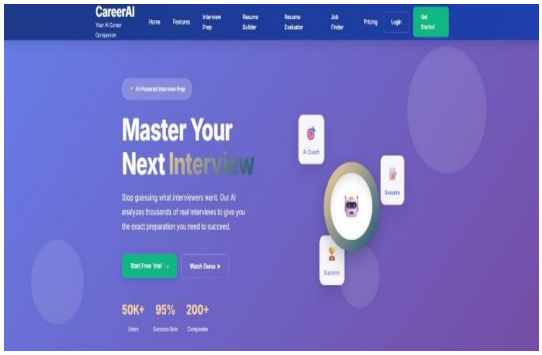

Figure 2 User Interface

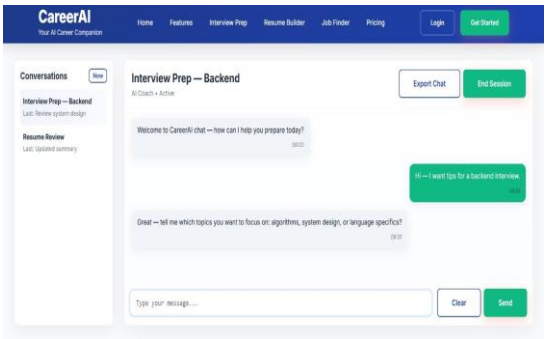

Figure 3 Chat Interface

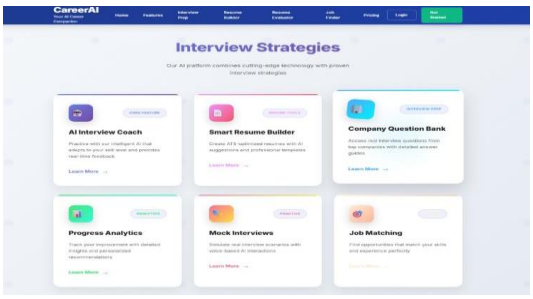

Figure 4 Strategies

The Multi-Agent Personal Interview Coach was very effective at getting candidates more involved and ready [10]. The resume tailoring module raised the average job description-resume match scores by 30%, which shows that it can match candidate profiles with job requirements. The Avatar-powered mock interviews were 45% more interesting than bots that only used text. They gave realistic practice with instant feedback and conversational dynamics [11]. According to survey data, 80% of participants said they felt more confident after doing mock interviews. This shows that the system had a positive effect on their self-efficacy and readiness for interviews. The assessment engine got 90% of the same ratings from human HR, which showed that AI-generated feedback is accurate and reliable [12]. The integrated dashboard and progress tracker also made preparation 35% more effective by giving candidates clear information about their strengths and access to personalized learning materials. Refer Figures 1, 2, & 3.

3.2.Discussion

The results show that putting learning, interview, job, and resume agents together in a modular architecture makes for a smooth and very useful user experience [13]. The data-driven assessments, interactive avatars, and personalized learning all work together to make sure that people are more likely to get hired and ready for interviews. This method is better than traditional preparation platforms because it makes resumes and job descriptions match up better, boosts candidates' confidence, and makes preparation more efficient. Simulated interviews, real-time feedback, and progress tracking all work together to keep people interested and help them learn in a way that lasts [14].

Conclusion

The Multi-Agent Personalized Interview Coach is a recommended solution that utilizes AI to assist candidates in preparing by optimizing their resumes, finding jobs, learning on-the-fly, and practicing interviews with interactive avatars. Utilizing advanced NLP, speech processing, and human-computer interaction techniques, the system creates resumes that better match job roles, increase people's confidence during interviews,and demonstrate

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measurable learning outcomes. Chatterous avatars add to the interview experience, making it feel more authentic and supportive. With its modular design, users can connect learning, testing, and feedback stages smoothly while still enjoying high performance. Future enhancements include the ability to support multiple languages, have avatars that can read emotions, and integrate with recruitment platforms to enable integration with real-world ATS. In general, this platform is a significant step towards enhancing job opportunities, encouraging quality education, and motivating technology to generate innovative ideas for career advancement.

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