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AI Mock Interviewer: Preparing You Towards Smarter Interview Practice

Bhagyashree Patil[1], Vaishnavi Sarmalkar[2], Farhat Shaikh[3], Kuntal Thakur[4], Rohit Wahwal[5]

[1] *Artificial Intelligence and Data Science Department, Shah & Anchor Kutchhi Engineering College*
[2] *Artificial Intelligence and Data Science Department, Shah & Anchor Kutchhi Engineering College*
[3] *Artificial Intelligence and Data Science Department, Shah & Anchor Kutchhi Engineering College*
[4] *Artificial Intelligence and Data Science Department, Shah & Anchor Kutchhi Engineering College*
[5] *Artificial Intelligence and Data Science Department, Shah & Anchor Kutchhi Engineering College*

Abstract - In today's fiercely competitive job market, interview performance plays a pivotal role in securing employment. However, candidates often face the challenge of limited access to personalized and realistic interview practice opportunities, hindering their confidence-building efforts. To address this gap, we propose an AI-powered mock interviewer web application that creates an interview environment for candidates and elevates their interview preparation. The web app extracts vital information from user-uploaded resumes using Google's Palm model and Textract, crafting interview questions customized to the user's role and skills. It offers HR and Technical interview rounds. The HR segment assesses soft skills, while the Technical round presents role-specific technical questions, resulting in comprehensive performance reports and personalized feedback for targeted preparation. Notably, the web app employs voice analysis to detect fillers, pauses, and repetitive language, offering practical insights for improved communication. This analysis provides practical insights into communication challenges and offers actionable feedback to improve interview articulation and bolster user confidence.

Key Words: Interview Preparation, AI-Powered Mock Interview Simulation, Personalized Feedback, Confidence Building

1. INTRODUCTION

In the contemporary professional sphere, characterized by unrelenting competition and high-stakes decision-making, interview performance has transcended its conventional role as a mere formality. Instead, it has evolved into a pivotal determinant of one's ability to secure coveted employment positions. The proficiency exhibited during interviews now directly correlates with the realization of career aspirations. However, the path to mastering this intricate art form is fraught with challenges, chief among them being the scarcity of accessible, personalized, and pragmatic interview preparation opportunities. In this dynamic context, the emergence of the proposed AI-Powered Mock Interviewer Web Application heralds a promising paradigm shift.

This paper presents the blueprint of an innovative solution aimed at addressing the formidable issues faced by job seekers on a global scale. The inception of this application was inspired by the realization that countless job seekers struggle to bridge the gap between their skill sets and the specific attributes that employers seek. Empowered by state-of-the-art artificial intelligence and modern technology, this application seeks to alleviate the burdens associated with job preparation.

The core objective of this application is to serve as a dedicated partner in a candidate's journey towards interview success. It is designed to equip individuals with the essential skills and unwavering confidence required to excel in interviews. Leveraging advanced AI technology, our application creates an immersive interview environment that faithfully replicates real-world scenarios, enabling candidates to practice within an authentic context.

One of the pivotal distinctions of this application lies in its commitment to moving beyond mere question-and-answer sessions. It employs meticulous analysis of candidates' responses, offering tailored feedback that astutely identifies strengths and areas necessitating improvement. This personalized feedback functions as a detailed roadmap for candidates, empowering them to refine their interview techniques effectively.

Furthermore, our application places a profound emphasis on the cultivation of self-assurance. Through a series of realistic practice sessions and expert guidance, we provide candidates with the indispensable tools required to fortify their confidence levels. This approach ensures that candidates enter interviews with the self-assuredness requisite for success.

2. METHODOLOGY

Our methodology and approach center on the development of an AI-powered interview preparation system, harnessing the capabilities of Google's PaLM (Prompting Language Model). PaLM is a substantial 540 billion-parameter transformer-based language model known for its proficiency in processing and generating human-like text. It is noteworthy that PaLM stands on par with other prominent transformer-based models such as OpenAI's GPT-3 and GPT-4, yet it distinguishes itself through its substantial size and unique training process. Our approach encompasses several key steps, which we detail below.

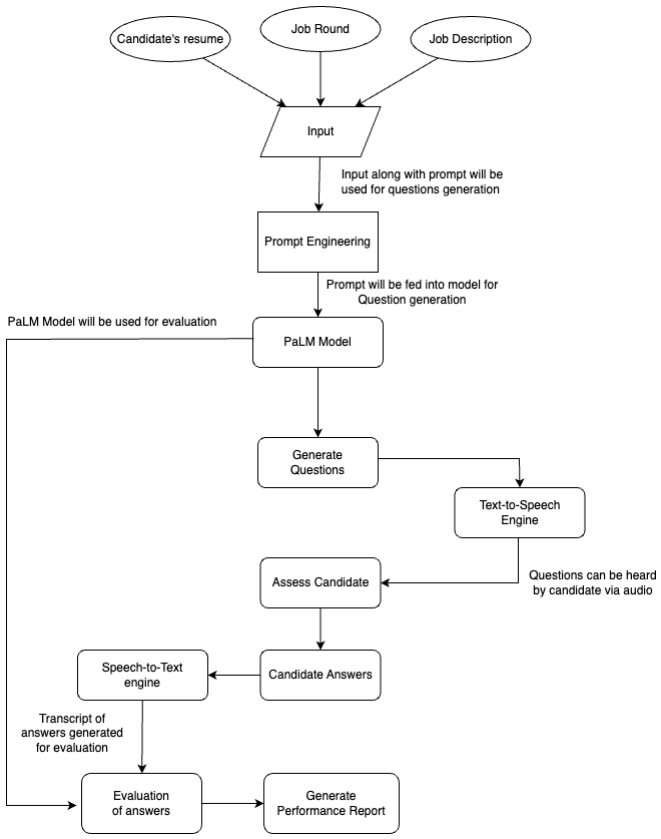

Fig. 1. Flowchart of AI Mock Interviewer

A. Data Collection

1) Job Description: The process begins with the input of a job description, which provides essential information about the role's requirements, responsibilities, and desired qualifications. This job description serves as a reference point for generating relevant interview questions.

2) Resume: Additionally, the candidate's resume is provided as input. The resume contains details about the candidate's skills, qualifications, and work experience, which are crucial for tailoring interview questions to their specific background.

3) Job Round Specification: The system takes into account whether the interview round is HR (Human Resources) or Technical. This information guides the type of questions generated, with HR rounds focusing on soft skills and behavior, while Technical rounds emphasize domain-specific knowledge.

B. Prompt Engineering

Once the job description, resume, and job round information are available, prompt engineering is performed to create a suitable query for Google's PaLM model. The prompt is carefully crafted to instruct the model to generate interview questions and their corresponding answers that align with the provided inputs.

C. Utilizing Google's PaLM Model

Google's PaLM model, a Large Language Model (LLM), is employed to generate interview questions and answers based on the engineered prompt. PaLM is specifically instructed to generate contextually relevant questions that are tailored to the candidate's skills, qualifications, and the specified job round (HR or Technical).

D. Evaluation of Answers

After the candidate receives the generated interview questions and provides answers, a comparison process is initiated. The content similarity between the candidate's responses and the model-generated answers is measured. This comparison helps assess the candidate's alignment with the expected interview responses, providing insights into their suitability for the role.

E. Candidate Performance Report

Based on the content similarity analysis and other evaluation criteria, a comprehensive Candidate Evaluation Report is generated. This report summarizes the candidate's performance in the interview round, highlighting strengths and areas requiring improvement. It offers actionable feedback to help candidates enhance their interview skills and readiness.

F. Iterative Feedback and Improvement

To continually improve the system's performance, iterative feedback mechanisms are implemented. User feedback, as well as the accuracy and relevance of generated questions and evaluations, are considered in refining the system's prompt engineering and model utilization.

3. PURPOSE

In today's competitive job market, interview performance is a critical factor in securing employment. However, job seekers often face challenges in preparing for interviews and building confidence during the process. They struggle with limited access to personalized and realistic interview practice opportunities, resulting in missed chances to shine and secure their desired positions.

This paper proposes the development of an AI-powered interview preparation web app that utilizes a mock interviewer approach to assist candidates in honing their skills, boosting their confidence, and maximizing their chances of success. The proposed web app will offer a comprehensive interview preparation experience, specifically designed to address the unique requirements of each candidate's chosen role. By leveraging AI technologies, the web app will provide a realistic and immersive interview environment that closely mimics actual interview scenarios.

The web app will benefit job seekers by:

1. Providing personalized interview practice opportunities tailored to their specific needs and goals
2. Offering real-time feedback on their performance, helping them to identify and address areas for improvement
3. Boosting their confidence and preparedness for real-world interviews
4. Maximizing their chances of success in securing their desired positions

The web app will also benefit employers by:

1. Helping them to identify and hire the most qualified candidates for their open positions
2. Reducing the time and cost associated with the interview process
3. Improving the overall hiring experience for both candidates and employers

The development of this AI-powered interview preparation web app has the potential to revolutionize the way job seekers prepare for and approach interviews. By providing personalized, realistic, and immersive practice opportunities, the web app can help candidates hone their skills, boost their confidence, and maximize their chances of success.

4. MAJOR RESEARCH FINDINGS

During our research, we discovered several related works that did not belong to the same domain as ours. However, in the end, we identified the following technical research papers that were closely aligned with our domain. As to academic research and patents, most previous works focus on developing a system that can help candidates/professionals sharpen their soft and technical skills. One of them that really focuses on that is Jaro -- Jaro works by first analyzing the candidate's resume to generate a set of personalized questions. Then, during the interview, Jaro uses NLP to understand the candidate's responses and ask follow-up questions as needed. Jaro can also detect and respond to emotional cues in the candidate's voice and body language.

Jaro's features include: Personalized questions based on the candidate's resume, Follow-up questions based on the candidate's responses, Detection and response to emotional cues, Objective and unbiased scoring of candidate responses, and much more. Jaro's algorithm is based on a combination of NLP techniques, including Text classification, Named entity recognition, Question answering, and Sentiment analysis. Jaro was evaluated on a dataset of real-world job interviews. The results showed that Jaro can generate high-quality interviews that are comparable to those conducted by human interviewers.The main aim of designing the project is to generate a final report which will be sent to the hiring manager, through which the candidates will be short-listed [2].

Furthermore, we referred to the 'Automated Analysis and Prediction of Job Interview Performance' Project which mainly focuses on the visual and audio rating of the candidate. This project uses a variety of machine learning techniques to analyze facial expressions, body language, and voice tone to predict the candidate's performance in the interview.This project is relevant to our literature review because it demonstrates the potential of machine learning to be used for job interview analysis. While Jaro focuses on the linguistic aspects of the interview, this project shows that it is also possible to use machine learning to analyze nonverbal cues.
The findings of this project suggest that a multimodal approach to job interview analysis, which combines both linguistic and nonverbal cues, could be even more effective than using either mode of analysis in isolation. This is an area for future research, and we believe that Jaro could be extended to incorporate multimodal analysis in the future.

In addition to the potential benefits of multimodal analysis, this project also highlights the importance of considering the ethical implications of using machine learning for job interview analysis. It is important to ensure that such systems are fair and unbiased and that they do not discriminate against candidates based on race, gender, or other factors.
Overall, this project is a valuable contribution to the field of job interview analysis, and its findings suggest that machine learning has the potential to revolutionize the way that interviews are conducted in the future.

Online website includes Interview School which is a mock interview website that provides users with real interview questions from real companies, AI-assisted feedback, and the ability to connect with live interview coaches. The website is designed to help users prepare for job interviews and improve their chances of getting hired.

5. PRACTICAL

The web application offers practical implications that are poised to significantly benefit both job seekers and the broader employment ecosystem. In the contemporary job market, where interview performance stands as a decisive factor in securing employment, this application addresses pressing needs and offers several noteworthy practical implications.

First and foremost, the application's capability to extract skills and qualifications from user-uploaded resumes and generate interview questions based on these qualifications is of immense practical value. This feature alleviates the challenge faced by job seekers in aligning interview preparation with their specific skill sets and job roles. By tailoring questions to the user's skills and desired position, the application ensures practical relevance and provides focused interview practice. Job seekers can thus efficiently direct their preparation efforts toward the specific requirements of their target roles, enhancing their practical prospects of securing employment.

The division of interview practice into HR and technical rounds also carries practical implications. The HR round, designed to assess soft skills and behavioral aspects, equips job seekers with valuable insights into their interpersonal abilities. The resulting analysis and feedback offer practical guidance for improving these essential skills, which are often critical for interview success. On the other hand, the technical round, which evaluates domain-specific knowledge, directly addresses the practical need for candidates to demonstrate their technical prowess. The application's ability to comprehensively assess both soft and technical skills equips job seekers with a well-rounded practical preparation for diverse interview scenarios.

Voice analysis, a unique feature of the application, contributes practical insights into interview performance. Identifying filler words, pauses, fumbles, and repetitive language in one's speech during interviews holds practical implications for improving communication skills. We have used SpeechRecognition for the transcription of answers from the users. By addressing these aspects, job seekers can present themselves more confidently and articulately in real interviews, translating into practical advantages when competing for job opportunities.

The provision of detailed performance reports and personalized feedback further underscores the practical implications of this application. Users receive actionable insights into their strengths and areas for improvement, enabling them to focus their efforts effectively. This personalized feedback enhances the practicality of interview preparation by providing a clear roadmap for skill development.

6. RESEARCH LIMITATIONS/ IMPLICATIONS

The proposed AI-powered mock interviewer web application has the potential to revolutionize the way job seekers prepare for and approach interviews. However, there are a few research limitations that need to be addressed before the web app can be widely deployed:

1. User experience: It is important to design an AI-powered mock interviewer web application that is user-friendly and engaging. The application should be easy to use and navigate, and it should provide users with clear instructions and feedback. Additionally, the application should be able to scale to support a large number of users simultaneously.
2. Speech-2-Text: More advanced technology is needed to improve the accuracy and fluency of transcription and verbatim generation on the user's side.
3. Job roles: Currently, we are catering to more software-based roles because of our limited expertise which we can extend to more job roles.

7. ORIGINALITY/VALUE

This study introduces a distinctive approach to interview preparation that merges advanced AI methodologies with real-time performance analysis. By leveraging Google's Palm model and Textract for resume analysis, the application pioneers a new standard in tailoring interview questions to individual candidates, ensuring a highly personalized and pertinent practice experience. The integration of voice analysis to discern speech patterns and provide constructive feedback represents a pioneering leap forward in enhancing communication skills.

Moreover, the structured division of interview practice into HR and Technical rounds underscores our commitment to evaluating candidates comprehensively, offering a well-rounded preparation for a diverse array of interview scenarios. This holistic approach sets our application apart from existing tools that often focus on specific facets of interview preparation.

Furthermore, the delivery of detailed performance reports and personalized feedback equips candidates with precise guidance on skill enhancement, establishing a new benchmark in targeted interview preparation. This level of granularity and actionable insight stands as a unique feature in the domain of interview preparation applications.

The originality and value of this research lie in its groundbreaking amalgamation of technology-driven customization and comprehensive performance analysis, offering an unparalleled interview preparation experience.

8. CONCLUSION & FUTURE RESEARCH WORK

In conclusion, our proposed AI-powered mock interviewer web application represents a significant advancement in interview preparation, addressing a crucial need in today's competitive job market. By leveraging state-of-the-art methodologies, including Google's PaLM model, Textract, and Whisper the application extracts key information from user-uploaded resumes, tailoring interview questions to each candidate's specific role and skills. This personalized approach not only enhances the relevance of interview practice but also boosts candidate confidence.

The inclusion of both HR and Technical interview rounds provides a comprehensive evaluation of soft skills and technical proficiency, ensuring a well-rounded preparation for diverse interview scenarios. The innovative voice analysis feature further refines communication skills by identifying and addressing common speech challenges such as fillers, pauses, and repetitive language.

Moreover, the provision of detailed performance reports and personalized feedback empowers candidates to focus their efforts effectively, driving skill development and increasing their chances of interview success. The practical implications of this application are immense, benefiting both job seekers and the broader employment ecosystem.

Looking ahead, the development of this AI-powered interview preparation web app holds great promise for revolutionizing the way candidates prepare for interviews. With its ability to offer realistic and immersive practice opportunities, the web app stands to be a game-changer in the job market. However, it is crucial to remain mindful of ethical considerations, ensuring fairness and impartiality in the assessment process.
We believe that this innovative tool will be instrumental in shaping the future of interview preparation and performance assessment.

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