

AI Mock Interview Platform

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Abstract

The **Artificial Intelligence (AI) Mock Interview Platform** is an advanced system designed to enhance interview preparation through intelligent automation and real-time performance analysis. Building upon the initial prototype, the system integrates **Natural Language Processing (NLP), Computer Vision, and Speech Analysis** to simulate realistic interview scenarios and evaluate candidate performance effectively. The platform incorporates **face detection and verification using the Haar Cascade algorithm** to ensure secure and efficient user authentication. It conducts domain-specific and HR interviews in both text and voice modes, analyzing responses based on multiple parameters such as accuracy, fluency, sentiment, and confidence. Additionally, basic facial analysis is performed to monitor user engagement during the interview process. The system generates detailed feedback reports and performance scores, helping users identify strengths and areas for improvement. The enhanced design focuses on simplicity, faster execution, and accessibility while maintaining reliable evaluation. Experimental observations indicate that the platform improves user confidence and interview readiness. This solution provides a cost-effective and accessible approach to interview preparation, reducing dependency on human interviewers while delivering consistent and data-driven feedback.

Keywords

AI-Based Mock Interview, Face Recognition Authentication, Speech-to-Text Processing, Natural Language Processing (NLP), Automated Answer

Problem Statement

In today's highly competitive job market, many students and job seekers face difficulties in performing well during interviews due to a lack of real-time practice,

personalized feedback, and confidence. Conventional mock interview methods rely heavily on human interviewers, making them time-consuming, expensive, and not easily accessible to all candidates. Moreover, these methods often fail to provide consistent and objective evaluation of candidate performance.

There is a need for an intelligent and automated system that can simulate real interview environments, ensure secure user verification, and deliver instant, data-driven feedback. Such a system should be capable of analyzing both verbal and non-verbal aspects of a candidate's performance to provide a comprehensive evaluation. The proposed AI Mock Interview Platform addresses these challenges by utilizing Artificial Intelligence (AI) techniques such as Natural Language Processing (NLP) for response analysis and the Haar Cascade algorithm for real-time face detection and user verification. The system enables users to practice interviews in an interactive environment while receiving structured feedback on accuracy, confidence, and communication skills, thereby improving their overall interview performance.

Introduction

Interviews play a vital role in the recruitment process, as they evaluate a candidate's communication skills, technical knowledge, confidence, and overall personality. However, many candidates experience anxiety and lack adequate preparation due to limited access to realistic mock interview environments and expert feedback. Traditional methods of interview preparation are often theoretical and do not effectively simulate real-world interview conditions. To address these challenges, modern technology can be utilized to create intelligent systems that replicate real interview scenarios. The **AI Mock Interview Platform** is developed as an automated and interactive solution that allows users to practice interviews anytime and anywhere. The system provides secure user registration

and login functionality, with data managed efficiently through an administrative module. The platform leverages **Natural Language Processing (NLP)** to analyze user responses and evaluate parameters such as accuracy, grammar, and relevance. Additionally, it uses the **Haar Cascade algorithm** for real-time face detection and user verification, ensuring authenticity and monitoring user engagement during the interview process. The system supports both text-based and voice-based interview modes to enhance user experience. By providing structured feedback and performance analysis, the platform helps users identify their strengths and weaknesses, improve communication skills, and build confidence. Thus, the system makes interview preparation more accessible, efficient, and practical for students and job seekers.

Motivation

The motivation behind this project is to improve traditional interview and assessment methods by making them more efficient, secure, and intelligent. Existing systems lack proper evaluation of communication skills and are prone to cheating or impersonation. By using AI technologies like face recognition, speech processing, and NLP, the system aims to provide automated, accurate, and real-time feedback. This helps users practice effectively and prepares them better for real-world interviews.

Literature Survey

Rubi Mandal, Pranav Lohar, Dhiraj Patil, Apurva Patil, Suvarna Wagh:

The paper "AI-Based Mock Interview Evaluator" reviews various studies on virtual interview systems, emphasizing emotion recognition, sentiment analysis, and confidence evaluation. It highlights the use of machine learning models to analyze non-verbal cues such as facial expressions, eye movements, and head posture. Additionally, EEG-based techniques for tracking emotions are explored. The study also delves into speech recognition and natural language processing, utilizing databases like Ryerson and Sentiment Speech to classify emotions in speech. Personality traits and behavioral characteristics are assessed using human computer interaction (HCI) systems, enabling candidates to improve their interview performance in realistic scenarios. This research supports the development of an AI system that evaluates

both emotional and confidence aspects, delivering a comprehensive mock interview experience.

Nirgide Shubhangi Vishal, Sayyed Arsh Aktharali, Patil Paresh Narendra, Raktate Shriraj Vikas, Pathan Md Fazal Mushtaque:

The paper "AI-Based Interview Critique System" examines advancements in AI-driven mock interview platforms, focusing on speech emotion recognition, behavioral analysis, and real-time evaluation techniques. Studies discussed include the integration of deep learning models such as EmoConfidNet for speech emotion recognition, enhancing confidence estimation through data preprocessing. The research also emphasizes the importance of mock interview systems in improving candidate performance by assessing non-verbal cues, including facial expressions and posture. Collectively, these studies contribute to the development of a comprehensive AI system that offers personalized feedback, helping candidates refine both technical and behavioral skills.

Aditi S. More, Samiksha S. Mobarkar, Siddhita S. Salunke, Reshma R. Chaudhari:

The paper titled "Smart Interviews Using AI" proposes an AI-based system that evaluates candidates' personality traits through video and speech emotion recognition. The system aims to address the inefficiencies of traditional interview methods by offering an objective, efficient, and unbiased solution. By analyzing facial expressions and speech emotion, the system gauges candidates' emotional states and behavioral traits during interviews. This AI-based approach enhances the recruitment process by saving time and improving accuracy, particularly in online interviews. The paper reviews various AI models, including Convolutional Neural Networks (CNN) and TensorFlow-based systems, for real-time emotion and personality analysis. Future improvements are suggested, such as incorporating additional parameters to further refine the system's accuracy and effectiveness for AI-driven interviews.

DulminiYashodhaDissanayake,

VenuriAmalya, RaveenDissanayaka,

LahiruLakshan, PradeepaSamarasinghe,

MadhukaNadeeshani, Prasad

Samarasinghe :The paper "AI-Based Behavioral Analyser for Interviews/Viva" presents a system that enhances the assessment of behavioral cues in online interviews. Using deep learning techniques, the system analyzes non-verbal cues, including emotions, eye movements, head movements, and smile patterns, to evaluate personality traits based on the Big Five model. The proposed system demonstrates high accuracy (over 85%) in detecting behavioral changes, offering a comprehensive analysis that allows for fair comparisons among candidates. This solution addresses the limitations of previous systems that focused primarily on verbal communication by providing a more detailed analysis of non-verbal behavior. The paper highlights the system's applicability in both professional and academic settings, demonstrating significant improvements in accuracy and comprehensiveness.

B C Lee, B Y Kim:

The paper "Development of an AI-Based Interview System for Remote Hiring" introduces a deep-learning powered solution designed to improve recruitment processes, particularly for remote settings. The AI system, developed using over 400,000 interview image datasets, achieved a high Pearson reliability score of 0.88 and was successfully applied in multiple public enterprises in South Korea, with a satisfaction rate of 85%. The paper highlights the growing global trend of AI adoption in hiring processes, focusing on job fitness evaluations, personality assessments, and applicant screening. By incorporating advanced facial, vocal, and linguistic analysis, the AI system aims to provide objective and unbiased evaluations, streamlining recruitment processes and increasing overall hiring efficiency. The research underscores the potential of deep learning models in enhancing both candidate evaluation and recruitment practices.

S. Sridhar, S. Mootha and S. Kolagati:

In this paper, a stacked ensemble model that predicts the chances of admit of a student to a particular university has been proposed. The proposed model takes into

consideration various factors related to the student including their research experience, industry experience etc. Further, the system proposed has been evaluated against various other machine learning algorithms including other deep learning methods. It is observed that the proposed model easily outperforms all other models and provides a very high accuracy.

Motivation

Many students and job seekers struggle to prepare effectively for interviews due to limited access to professional mock interviewers and the absence of real-time, personalized feedback. Traditional interview preparation methods primarily focus on theoretical knowledge rather than practical exposure, which creates a gap between what candidates learn and how they perform in actual interview situations. Additionally, existing solutions often lack accessibility, consistency, and objective evaluation, making it difficult for candidates to identify their weaknesses and improve systematically. The fear of facing real interviews without prior practice further reduces confidence and performance. This motivates the development of an intelligent and automated system that can provide a realistic interview environment, continuous practice opportunities, and structured feedback. The proposed AI Mock Interview Platform aims to bridge this gap by **enhancing both** technical knowledge and behavioral skills, ultimately improving candidate confidence and interview readiness.

Proposed System

The **AI Mock Interview Platform** is designed to provide users with an intelligent and interactive environment for practicing job interviews. The system integrates **Natural Language Processing (NLP)**, **Speech Recognition**, and **Computer Vision (Haar Cascade-based face detection)** to simulate a realistic interview experience and evaluate candidate performance effectively. The proposed system allows users to register and log in securely, with all user data managed through a centralized database. After authentication, **Haar Cascade-based face detection** is used to verify user presence and ensure authenticity before initiating the interview session. Once verified, the system conducts mock interviews in both **text and voice modes**, where the AI interviewer asks domain-specific and HR-related questions. The user's responses are

analyzed using NLP techniques based on parameters such as **accuracy, grammar, relevance, tone, and confidence**. Additionally, speech analysis is used to evaluate fluency and communication skills during voice-based interviews.

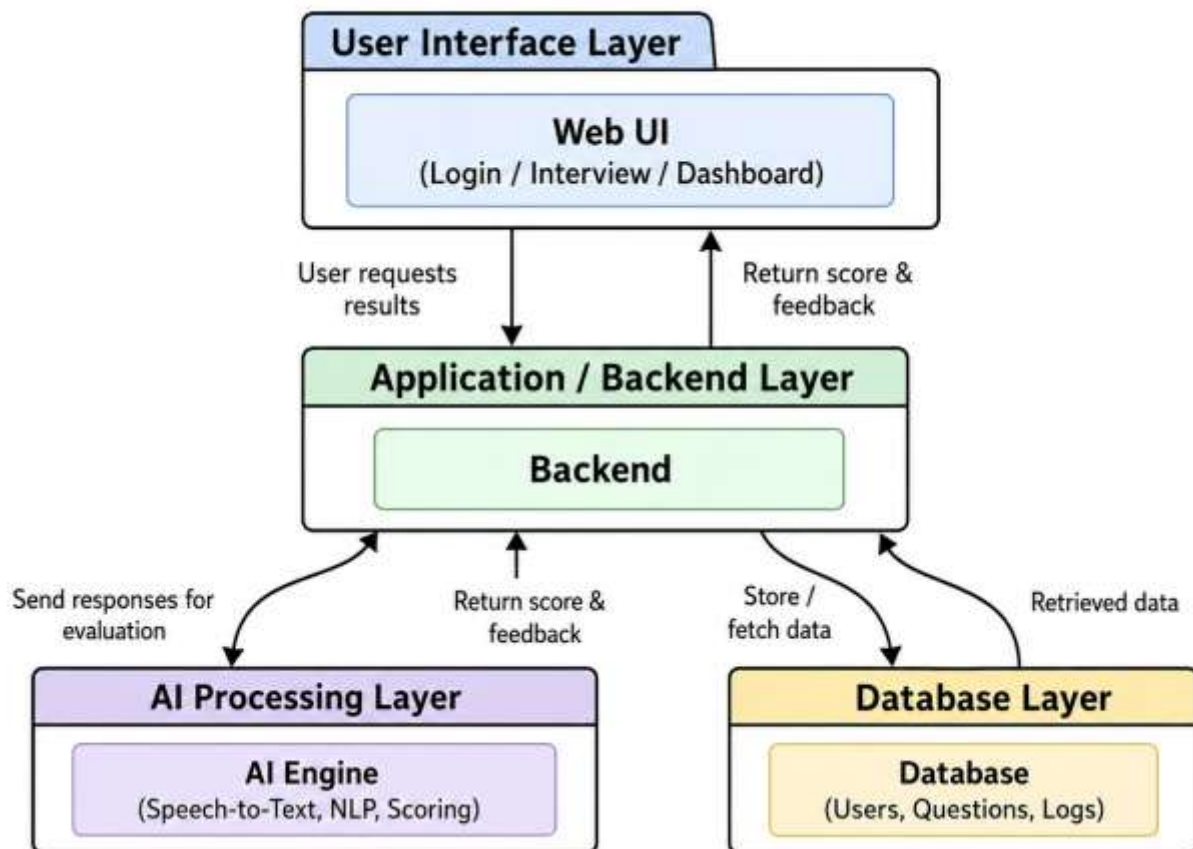
All responses, performance metrics, and evaluation scores are stored securely in the database for future reference. The system then generates a **detailed**

feedback report highlighting the user's strengths, weaknesses, and areas for improvement.

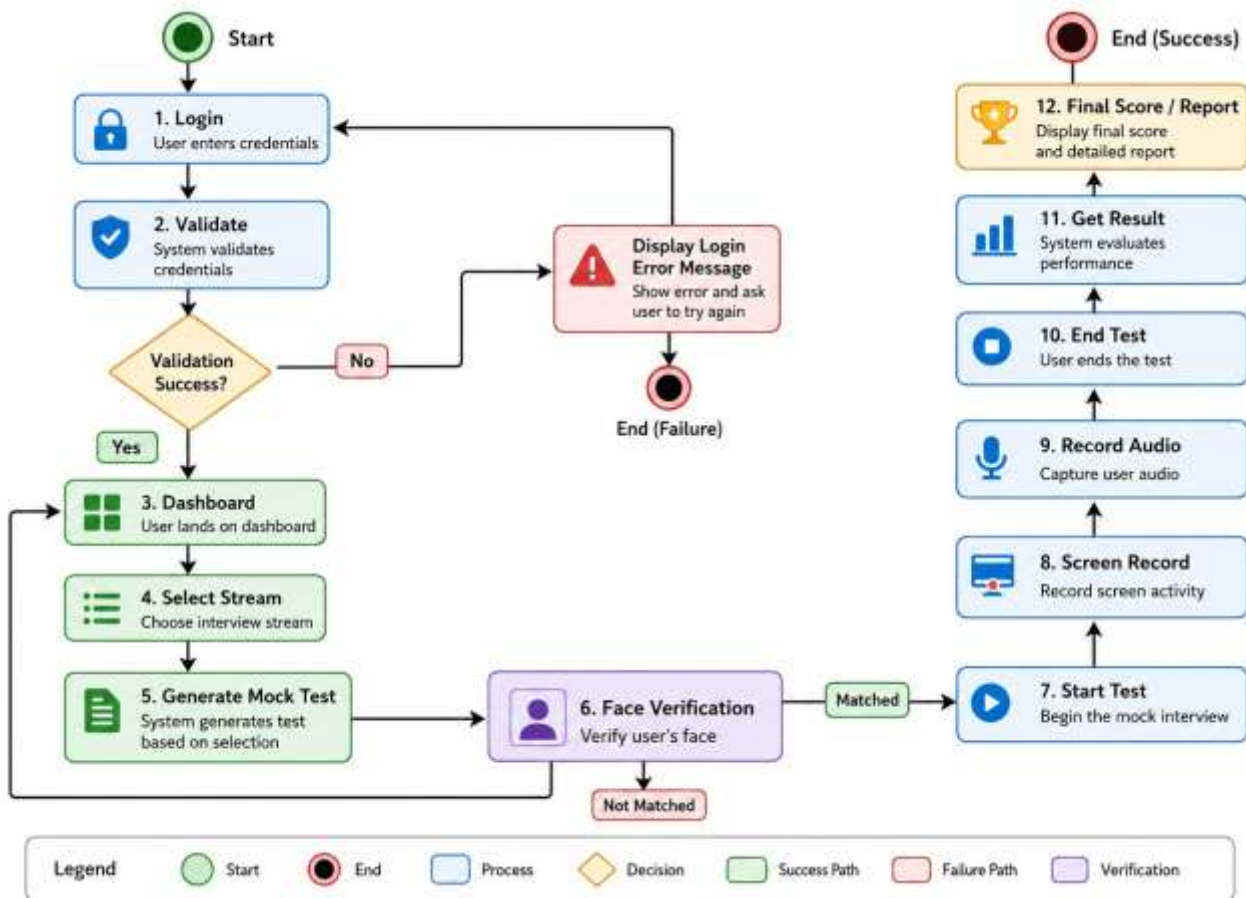
The proposed platform focuses on **real-time interaction, ease of use, faster execution, and accessibility**, making it a reliable and efficient tool for interview preparation. It helps users improve both technical knowledge and behavioral skills, thereby enhancing overall interview readiness.

Architecture

Architecture - AI Mock Interview Platform



Flowchart



Conclusion

The **AI Mock Interview Platform** provides an efficient, interactive, and intelligent solution for preparing candidates for real-world interviews. By leveraging Artificial Intelligence techniques such as **Natural Language Processing (NLP)**, **Speech Analysis**, and **Haar Cascade-based face detection**, the system evaluates user performance in terms of communication skills, confidence, and overall behavior. The platform enables users to identify their strengths and weaknesses through structured feedback and performance reports, helping them improve both technical and soft skills. Its automated and accessible nature reduces dependency on human interviewers while ensuring consistent and objective evaluation. Overall, the system enhances interview readiness, builds user confidence, and bridges the gap between theoretical preparation and practical performance. The proposed solution demonstrates the potential of AI-driven systems in transforming interview preparation into a more effective and scalable process.

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