

SpeakSense: AI Powered Interview Analyzer and Feedback System

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Abstract

The increasing competition in the job market has made effective interview performance a critical skill for students and professionals. However, many candidates struggle with communication clarity, confidence, and structured responses due to the absence of personalized and objective feedback during interview preparation. To address this challenge, this paper presents SpeakSense, an AI-powered interview analyzer and feedback system designed to simulate real-world interview scenarios and assist candidates in improving their interview skills. The proposed system leverages artificial intelligence technologies such as speech-to-text processing, natural language understanding, and generative AI models to analyse candidate responses in real time. Spoken answers are transcribed and evaluated to assess factors including content relevance, clarity of expression, and overall communication effectiveness. Based on this analysis, the system generates intelligent feedback, confidence scores, and performance insights through an interactive web-based dashboard. The platform supports automated question generation, structured response evaluation, and session-wise performance tracking, making interview practice scalable and accessible. By reducing dependency on human evaluators and minimizing subjective bias, SpeakSense offers a reliable, data-driven solution for interview preparation. The system aims to enhance candidate confidence, improve communication skills, and provide continuous learning support, thereby contributing to more effective and technology-driven interview training.

Keyword: AI-based interview, AI interview system, natural language processing (NLP), AI-based solution, feedback

INTRODUCTION

In the modern recruitment landscape, interviews play a decisive role in evaluating a candidate's suitability for a specific role. While academic qualifications and technical knowledge are important, factors such as communication skills, confidence, clarity of thought, and structured response delivery significantly influence the interview outcomes. Many students and job seekers, despite having adequate technical preparation, face difficulties performing well in interviews due to nervousness, lack of practice, and absence of constructive feedback.

Traditional interview preparation methods, including peer-to-peer mock interviews and coaching sessions, are often limited by their availability, cost, subjectivity, and scalability [1]. With rapid advancements in artificial intelligence (AI), new opportunities have emerged to transform interview preparation using intelligent automated

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systems. AI-driven applications are increasingly being adopted in domains such as education, skill assessment, and recruitment because of their ability to analyze large volumes of data, provide consistent evaluations, and reduce human bias. In the context of interview training, AI can simulate realistic interview environments, dynamically generate questions, and evaluate candidate responses using data-driven techniques. This enables candidates to practice interviews independently while receiving structured and objective feedback [2].

This study introduces SpeakSense, an AI-powered interview analyzer and feedback system designed to assist candidates in improving their interview performance through automated mock interviews. The system utilizes speech-to-text technology to convert spoken responses into textual data, which are further analyzed using natural language processing and generative AI models. By examining factors such as content relevance, clarity of expression, and communication effectiveness, the system provides personalized feedback and confidence scores to users [3, 4]. Unlike conventional mock interview approaches, SpeakSense offers continuous availability, standardized evaluation, and real-time insights, making it suitable for large-scale use.

The proposed system was implemented as a web-based platform that allowed users to securely log in, participate in AI-generated interviews, and track their progress through an interactive dashboard. By combining modern web technologies with AI-driven analysis, SpeakSense aims to bridge the gap between theoretical preparation and real-life interview performance [5]. The platform focuses on enhancing user confidence, improving communication skills, and enabling self-driven learning, thereby supporting candidates to become better prepared for real-world interview scenarios.

HOW AI INTERVIEW SYSTEM WORKS

System Architecture:

The SpeakSense platform is designed using a layered system architecture that integrates artificial intelligence, speech processing, and web technologies to deliver an automated interview analysis and feedback system [6]. This architecture enables real-time interaction between the candidate and the system while ensuring accurate evaluation and structured feedback generation. The system primarily utilizes natural language processing, AI analysis models, and cloud-based APIs to simulate the scenarios, as shown in Figure 1.

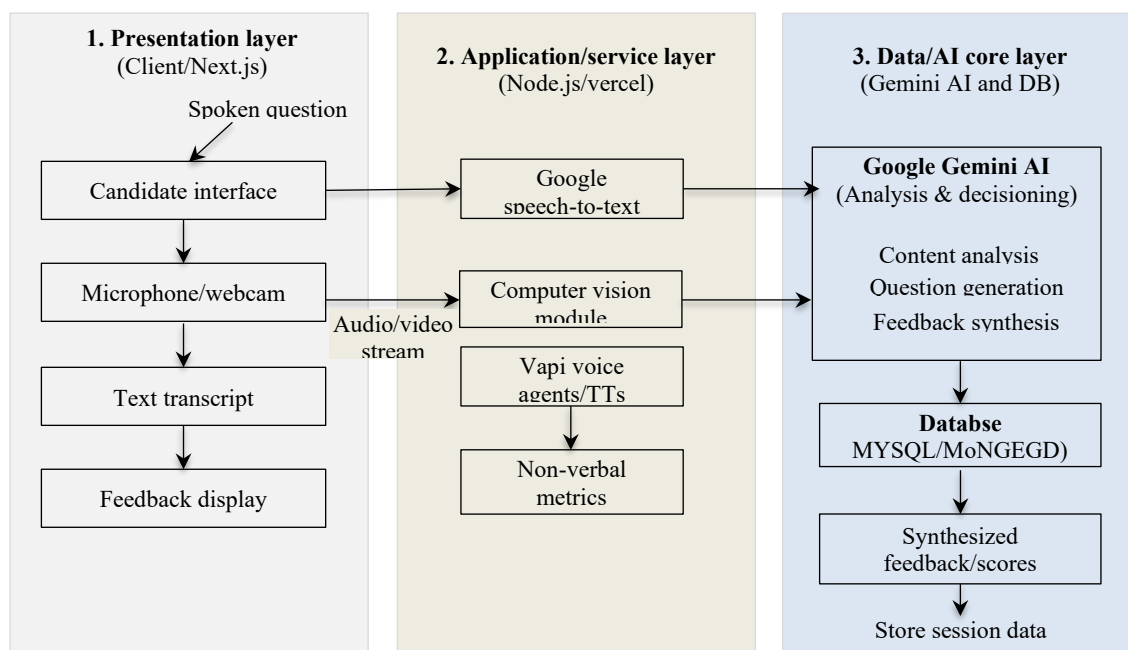


Figure 1. System architecture.

Natural Language Processing (NLP)

Natural Language Processing (NLP) is a core component of the SpeakSense system and plays a vital role in understanding and evaluating candidate responses. NLP focuses on enabling machines to process, analyze, and interpret human language meaningfully. In the proposed system, NLP techniques are applied to analyze the textual form of interview responses generated from speech-to-text conversion [7].

Content Analysis

The transcribed responses were examined to evaluate the clarity, relevance, and completeness of the answers with respect to the interview question. This helps determine how well the candidate has articulated their thoughts.

Sentiment and Tone Evaluation

The system analyzes the tone and sentiment of responses to understand whether the candidate's communication reflects confidence, hesitation, or uncertainty. This contributes to generating a confidence score for each interview session.

Language Understanding

NLP techniques help identify keywords, sentence structure, and coherence, allowing the system to assess the effectiveness of communication and professional language usage.

AI-Based Analysis Models

Unlike traditional systems that rely only on predefined rules, SpeakSense leverages AI-driven models to evaluate the performance of candidates more intelligently.

Response Evaluation Model

This model compares the candidate's responses against expected answer patterns and key concepts relevant to the interview question. The evaluation focuses on relevance, depth of explanation, and logical flow.

Feedback Generation Model

Based on the analysis, the system generates structured feedback highlighting strengths, areas for improvement, and communication gaps. This feedback was synthesized using generative AI techniques to ensure clarity and usefulness.

Similarity Scoring

Similarity scoring measures how closely a candidate's response aligns with the expected or ideal answer to a given interview question. This is achieved using text similarity techniques that are commonly applied in NLP tasks [8].

Cosine Similarity

Cosine similarity was used to compute the similarity between the vector representations of the candidate's answer and the reference answer content. The similarity score ranged from 0 to 1, with higher values indicating better alignment with the expected responses. This score contributes to the overall performance evaluation.

Google APIs Integration

The SpeakSense system integrates cloud-based APIs to handle speech processing efficiently [9].

Google Speech-to-Text API

This API converts spoken interview responses into textual format with high accuracy. The generated transcripts serve as input for NLP and AI-based analysis.

Text-to-Speech Support (Optional)

The system can optionally use text-to-speech services to deliver AI-generated questions in a natural and conversational manner, thereby enhancing the interview experience [10].

Different Models Used in the System***Question Generation Model***

The question generation model is responsible for conducting the interview session dynamically.

Input

The model takes user-selected interview parameters, such as job role, skill domain, or previous responses.

Processing

The system analyzes the interview context and determines the next appropriate question using AI-based reasoning.

Question Generation

Questions are generated dynamically to simulate real interview scenarios and can be adapted based on candidate responses.

Interaction

The candidate answers questions verbally or in text format through the interview interface.

Feedback Loop

Based on the responses, the system refines the subsequent questions and continues the interview until completion.

Communication Confidence Analysis Model

The SpeakSense system evaluates the candidate's communication confidence by analysing multiple response parameters.

Input

Input data includes speech transcripts, response length, and delivery patterns.

Processing

The model extracts indicators such as hesitation, response structure, and tone consistency.

Classification

Based on the extracted features, the system estimates the confidence levels and assigns a confidence score.

Feedback

The system provides actionable feedback to help candidates improve their clarity, fluency, and confidence.

Integration

This model works in coordination with the NLP and question-generation modules to ensure a smooth interview experience.

RESULT ANALYSIS**Main Interface**

The main interface of SpeakSense serves as the entry point for users and provides an overview of the AI-powered interview-analysis platform. The landing page presents essential information about the system, including its purpose, key features, and benefits of AI-driven interview preparation. It

guides users on how to use the platform to practice interviews and improve their communication skills. The interface includes navigation options for user registration and sign-in, enabling new users to create accounts and existing users to access their profiles. The design of the landing page ensures clarity, ease of access, and a smooth onboarding experience, allowing users to quickly understand the functionality of the SpeakSense system (Figure 2).

Sign-In Interface

The sign-in interface enables secure authentication for users before accessing interview functionalities. Registered users can log in using valid credentials to enter the system. This interface ensures controlled access to interview sessions and personalized dashboards. The authentication process allows the system to maintain the individual interview histories and performance records. A successful login redirects the user to the dashboard, where interview activities and feedback results can be accessed. The sign-in interface contributes to data security and ensures that interview analysis results are associated with the correct user profile (Figure 3).

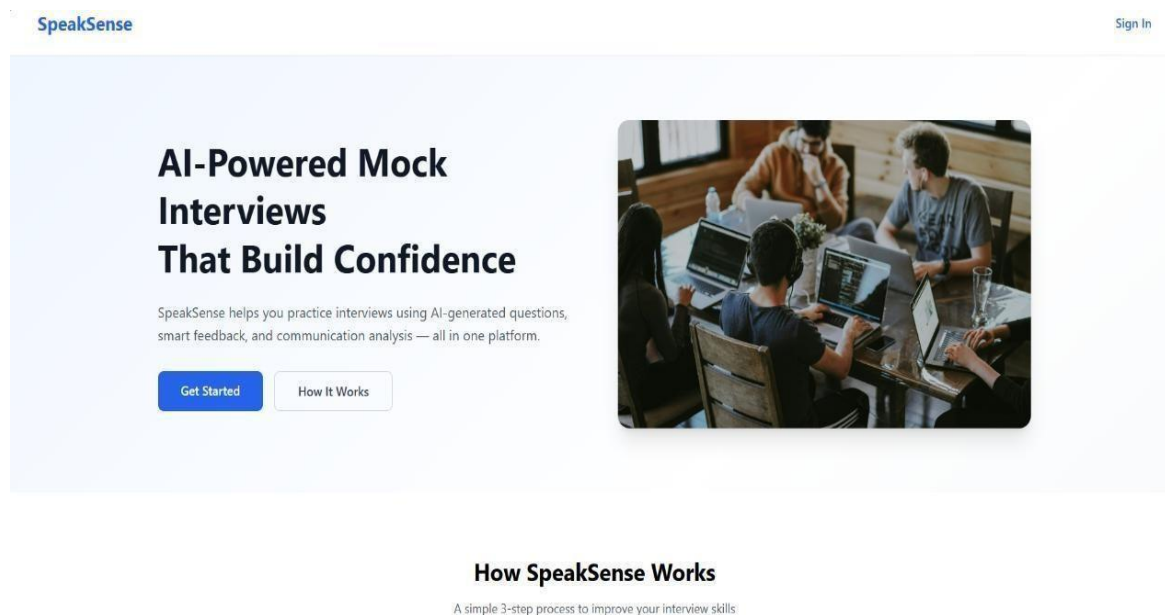


Figure 2. AI-powered mock interviews.

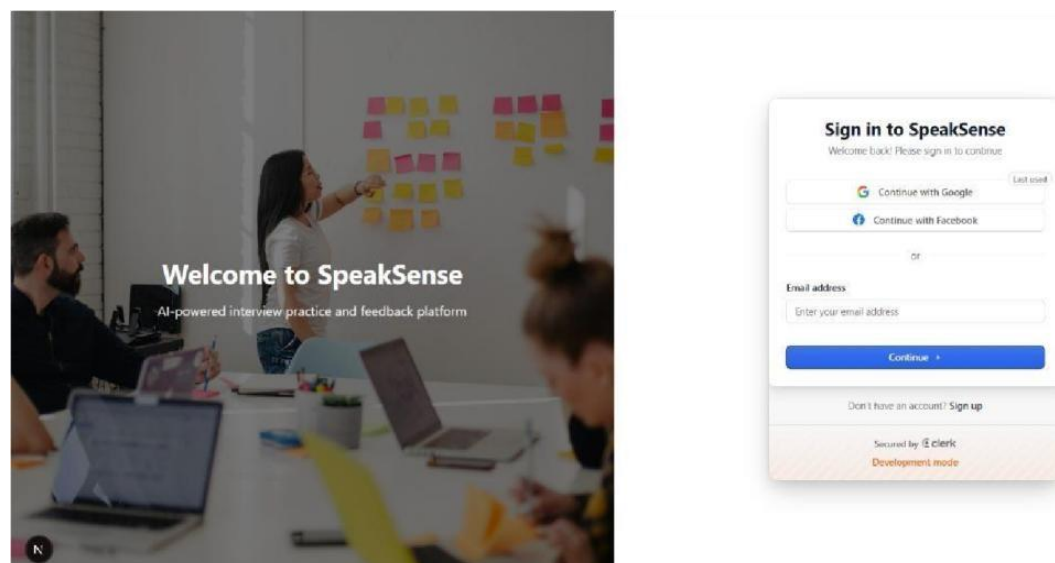


Figure 3. Sign in to speakSense.

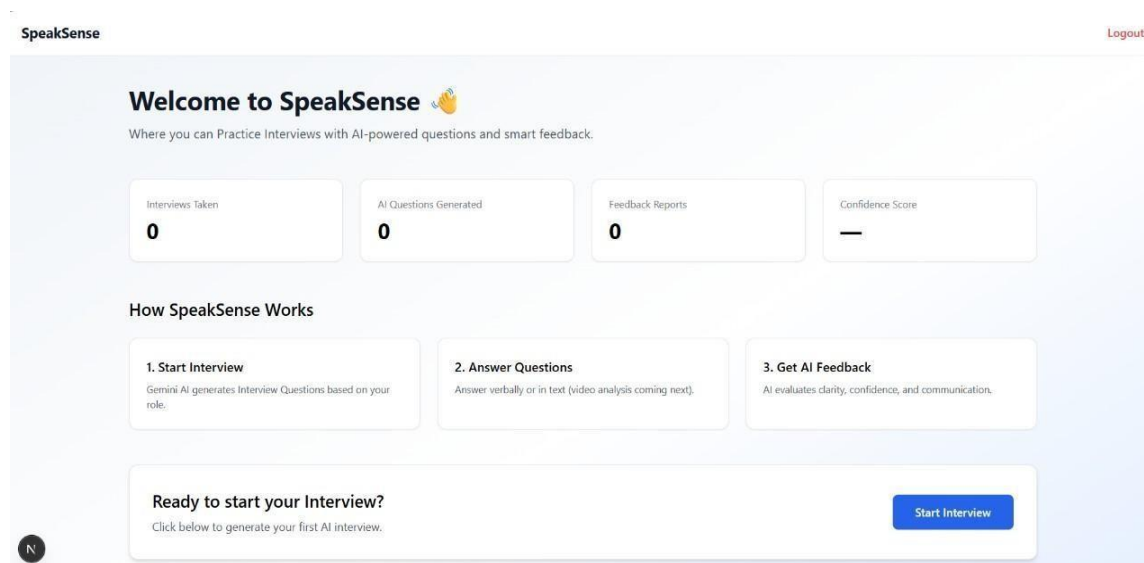


Figure 4. Dashboard of speakSense.

Dashboard Interface

The dashboard interface is the core component of the SpeakSense platform and plays a crucial role in presenting the interview results and feedback. After completing an interview session, users can view their performance analysis on the dashboard. The dashboard displays structured feedback, confidence scores, and response summaries generated by AI models. Users can track their progress over multiple interview attempts and identify the areas that require improvement. The visualization of the interview results helps candidates understand their strengths and weaknesses in terms of communication, clarity, and response relevance. This interface enables continuous self-assessment and supports data-driven improvement in interview performance (Figure 4).

CASE STUDIES

To evaluate the effectiveness of the SpeakSense system, several practical scenarios were analyzed to understand how the platform assists users in improving their performance during interviews. These case studies demonstrate how the system can be used by different types of candidates to practice interviewing, analyze responses, and receive structured feedback.

Case Study 1: Student Preparing for Campus Placement

A final-year engineering student preparing for campus placement interviews used the SpeakSense platform to practice commonly asked technical and behavioral questions. After logging into the system, the students initiated a mock interview session through the dashboard interface. The system generated interview questions relevant to the selected role and converted the spoken responses into text using speech-to-text technology.

The AI analysis module evaluated the responses and provided feedback on clarity, confidence level, and content relevance. The dashboard displayed a confidence score and suggestions for improving response structure. After multiple practice sessions, the student was able to improve communication clarity and response organization, demonstrating the effectiveness of the SpeakSense system in interview preparation.

Case Study 2: Job Seeker Improving Communication Skills

A job seeker preparing for technical interviews used SpeakSense to identify weaknesses in their communication and answer delivery. During the mock interview session, the candidate responded verbally to AI-generated questions. The system analyzed the responses using natural language processing techniques and generated detailed feedback on the results.

The dashboard results indicated areas such as hesitation, lack of detail in explanations, and brief responses. Based on the provided feedback, the candidate practiced multiple sessions and gradually improved the quality of their responses and overall confidence score. This case study highlights how SpeakSense helps candidates refine their communication skills through continuous feedback.

Case Study 3: Self-Assessment and Performance Tracking

Another important application of the SpeakSense system is self-assessment and progress tracking. Users can view interview history and performance metrics through the dashboard interface. Each session generates feedback reports and confidence scores, enabling the candidates to monitor their improvement over time.

By analyzing these results, candidates can identify recurring mistakes and focus on improving specific aspects, such as answer structure, technical explanation, and communication fluency. This feature allows SpeakSense to function as a mock interview platform and a personalized interview training system.

COMPARATIVE ANALYSIS

Comparative analysis with existing systems

Question Generation

In traditional mock interviews, questions are asked manually by mentors or peers. Many online platforms only provide fixed question sets. In contrast, SpeakSense dynamically generates interview questions using AI, making the interview process more interactive and realistic.

Feedback Mechanism

Traditional interviews depend on human feedback, which may vary from individual to individual. Existing platforms usually provide limited automated feedback. SpeakSense analyzes responses using AI and provides structured feedback to help users improve their responses.

System Availability

Conventional mock interviews depend on the availability of interviewers or trainers. While online platforms are accessible, they often lack real interview simulation. SpeakSense allows users to practice interviews anytime with AI-generated sessions.

Performance Tracking

Most traditional interview preparation methods do not track user performance. Some online tools offer limited evaluation features. SpeakSense provides a dashboard that stores interview histories, feedback reports, and performance insights.

Confidence Evaluation

Traditional methods rarely measure communication confidence. SpeakSense analyzes response clarity and communication patterns to generate a confidence score that helps users understand their performance during interviews.

INNOVATION INNOVATION IN THE PROPOSED SYSTEM

The SpeakSense system introduces several innovative features that enhance the effectiveness of AI-driven interview preparations. One of the primary innovations is the integration of speech analysis, natural language processing, and generative AI models within a single platform to simulate a realistic interview environment.

Unlike traditional systems that rely on static evaluation methods, SpeakSense uses AI to analyze the candidate responses and generate structured feedback in real time. The system also incorporates an interactive dashboard that allows users to track their interview sessions, analyze their confidence scores, and monitor their improvement over multiple attempts.

Another innovative aspect of the platform is its ability to provide personalized interview experiences, where the AI adapts questions and feedback based on the candidate's responses. This adaptive mechanism improves learning outcomes and makes interview preparation more engaging and effective for students.

These innovations position SpeakSense as a next-generation interview-training platform capable of supporting scalable and intelligent skill development.

CONCLUSION

In summary, the SpeakSense interview analyzer and feedback system represent a significant advancement in the field of interview preparation and skill development. By integrating an intuitive web-based interface with intelligent AI-driven analysis, this system offers an effective alternative to traditional mock interview methods.

The platform enables candidates to practice interviews in a realistic environment while receiving structured, objective and personalized feedback. The user-friendly design, including a secure login, guided interview flow, and an interactive dashboard, ensures accessibility and ease of use for a wide range of users.

A key strength of the SpeakSense system lies in its AI-powered question-generation and response-evaluation mechanism. By leveraging speech-to-text technology, natural language processing, and generative AI models, the system can analyze candidate responses in terms of relevance, clarity, and communication effectiveness. The adaptive nature of the interview process allows the system to generate context-aware questions, making the interaction more dynamic and closer to real-world interview conditions. This approach not only assists in evaluating candidate performance but also helps users identify specific areas that require improvement.

The feedback and scoring mechanism further enhances the effectiveness of the system by providing confidence scores and performance insights via the dashboard interface. These results enable candidates to track their progress across multiple interview attempts and refine their communication skills. By minimizing human bias and reducing dependency on manual evaluation, SpeakSense promotes a fair, consistent, and data-driven interview training process. Overall, the proposed system demonstrates strong potential for improving interview readiness and empowering candidates with self-driven learning tools.

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REFERENCES

1. Khapekar S, Bothara T, Babar T, Kine R. AI-powered mock interview system with real-time voice and emotion analysis. *International Journal of Novel Research and Development*. 2025;10(2).
2. Kumar R, Pandey V, Rauniyar RK, Rana M, Kumar S, Kamal H, Kumar H. Revolutionizing Interview Preparation: The Algorithmic Precision of an AI-Powered Mock Interview Platform. In *International Conference on Computer Vision and Robotics 2025 Apr 25* (pp. 63-74). Cham: Springer Nature Switzerland.
3. Pawar S, Misal G, Sanap V, Nanaware V, Berwal N. Advancing Interview Preparation: An AI-driven Approach. *Int. J. Sci. Res. Eng. Manag.(IJSREM)*. 2024 Feb;8(2):1-6.
4. Renganayaki S, Shriram R, Sudhir Krishna S. Mock Mate: An AI-Driven Real-Time Interview Assessment System Using Emotion and Sentiment Analysis. In *2025 IEEE 7th International Conference on Computing, Communication and Automation (ICCCA) 2025 Nov 28* (pp. 1-6). IEEE.
5. Yalcin N, Alisawi M. Enhancing social interaction for the visually impaired: a systematic review of real-time emotion recognition using smart glasses and deep learning. *IEEE Access*. 2025 Jun 5.
6. Gollapudi S. Artificial intelligence and computer vision. In *Learn Computer Vision Using OpenCV: With Deep Learning CNNs and RNNs 2019 Apr 27* (pp. 1-29). Berkeley, CA: Apress.
7. Matheson JL. The voice transcription technique: use of voice recognition software to transcribe digital interview data in qualitative research. *Qualitative Report*. 2007 Dec;12(4):547-60.
8. Park J, Zeanah AE. An evaluation of voice recognition software for use in interview-based research: A research note. *Qualitative Research*. 2005 May;5(2):245-51.
9. Nirgude M, Awasekar D. Artificial Intelligence in Interview Preparation: A Framework for Enhancing Employability Skills. In *2025 3rd DMIHER International Conference on Artificial Intelligence in Healthcare, Education and Industry (IDICAIHEI) 2025 Nov 28* (pp. 1-6). IEEE..
10. Mandal R, Lohar P, Patil D, Patil A, Wagh S. AI-Based mock interview evaluator: An emotion and confidence classifier model. In *2023 International Conference on Intelligent Systems for Communication, IoT and Security (ICISCOIS) 2023 Feb 9* (pp. 521-526). IEEE.