



# AI-Powered Unified Platform for Student Recruitment with Intelligent Interview Assessment

**1<sup>st</sup> Vinupriya R,**

*Student Department of Computer Science  
Sri Venketeswara College of Engineering Kanchipuram, India*

**2<sup>nd</sup> Dr S Kalavathi**

*Assistant Professor Department of Computer Science Sri Venketeswara College of Engineering  
Kanchipuram, India*

**Doi:** <https://doi.org/10.56975/ijcrt.v14i7.309075>

## Abstract

The recruitment and placement process in educational organizations most of the times are separated, slow, and they don't have standard methods for evaluating candidates. Students, colleges, and employers each work from their own separate platforms, and this causes a lack of coordination, less opportunities for interview practice, and different methods of assessing candidates. In order to solve these problems, this article suggests an AI-based integrated platform that brings all the parties together into one single system characterization. Artificial intelligence is used by the system so that it can simulate the interviews in real-time and also carry out automatic evaluation of the candidate based on their technical knowledge, communication skills, and confidence. It is developed with an expandable MERN-P architecture, which includes React.js for the frontend, FastAPI for the backend asynchronous processing, MongoDB for the data storage with high flexibility, and Supabase for the authentication and management of structured data. The platform has separate portals for the different categories of users like students, companies, and even administrators which allow them to interact with each other without any hindrance, manage the data in a centralized manner and keep track of the performance. Automated feedback and analytics are two of the great tools that can be used to boost student preparedness as well as the decision-making process. The solution put forward by this paper is one that will indeed bring in the factor of rise in productivity, giving room for growth and ensuring that the evaluation is carried out from the standpoint of fairness, thereby making this system the right fit for the contemporary recruitment.

**Keywords-**Artificial Intelligence, Recruitment System, Mock Interview FastAPI MERN Stack NLP, Real-Time, Systems, Student Portal, Placement System.

## I. INTRODUCTION

Last few years have witnessed significant changes in recruitment and placement processes due to technological breakthroughs. Yet, despite those changes, collaborations among students, educational institutions, and companies still remain very disjointed. Usually, every stakeholder has separate platform which causes communication failure, lack of coordination and different evaluation practices, etc. Manual traditional interviews are time taking and difficult to be scaled. Students generally get very less

opportunity of mock interviews realistic in nature and after thus they hardly get any structured feedback on their performance. At the same time it remains a challenge for recruiters and institutions in evaluating candidates considering that there are no standardized assessment criteria. This is the reason for us to think that we need an integrated, more intelligent solution that would simplify the whole recruitment flow. AI is a powerful tool that can change recruitment systems as it helps in automation, decision-making based on data, and in 24/7 analysis. Interview systems based on AI, especially those using NLP and ML

can imitate interview scenes, examine the replies of the candidate and provide instant feedback. Such features not only help in cutting down the work but at the same time increasing the correctness and fairness of the candidate's evaluation.

Artificial Intelligence (AI) has become a strong resource for changing the way recruitment systems work through automation, making decisions based on data, and performing real-time analysis. Interviewing the candidates via AI-based systems, especially those using methods such as Natural Language Processing (NLP) and machine learning, can replicate the processes of interviews, assess the answers of candidates, and deliver an immediate response. Such features help in speeding up the work and also making the evaluation of candidates more precise and fair.

In this setting, the system being proposed offers a single AI-driven platform that links students, colleges, and companies in one ecosystem. The platform supports activities like live interview practices, automatic scoring of performances, as well as the management of data in a centralized manner via different role-specific portals. Incorporating state-of-the-art technologies such as FastAPI, React.js, MongoDB, and Supabase, the system is capable of scaling, adapting to user interactions quickly, and handling data securely. This study aims mainly at making the step from college education to the job market smoother by presenting a well-rounded, easily expandable, and smart recruitment tool. The new platform not only prepares students better for their future careers but also makes it easier for businesses to find employees while allowing educational organizations to track and enhance the results of their placement efforts more efficiently.

## II. RELATED WORKS

Artificial intelligence (AI) is recognized as one of the most efficient technologies for the recruitment and interview systems because of its potential to automate and improve hiring processes. There are several works that have studied the usage of AI, for example, Natural Language Processing (NLP), machine learning, conversational agents, in different recruitment phases.

According to a systematic review of AI in recruitment, AI technologies are mostly employed for candidate sourcing, resume screening, interview scheduling, and performance

assessment. These tools help to increase the productivity, decrease the manual work, and support the data-driven decision-making in hiring processes. Nonetheless, this report mentions several problems including bias in algorithms, lack of transparency, and ethical challenges that arise when decisions are made by machines. Studies dedicated to the NLP-based recruitment systems show that with the use of modern models as BERT and GPT candidate screening, ranking, and matching processes can be improved to a great extent. What is more, such applications have the potential to enable simulation of chatbot-based interviews where an interviewee interacts with an intelligent machine. These approaches help in improving recruitment efficiency however they usually work within the boundaries of a specific function like resume analysis or initial screening.

Furthermore, another study analyzing the implementation of AI in IT companies of India reveals that different forms of AI, like NLP, machine vision, and automation, have the potential to improve several stages of recruiting, namely sourcing, engagement, and evaluation. In turn, it is found out that the use of these technologies can make it easier to recruit new employees while boosting productivity. Nevertheless, these systems tend to be firm-specific, failing to integrate across multiple stakeholders.

Another innovation within the sphere involves using conversational models to create AI-powered interviewing tools. Such tools can conduct interviews interactively and provide customized responses to candidates that will aid them in preparing for the interview process. These tools solve issues related to scalability. However, such tools focus only on giving feedback to candidates during the interview phase without having the capacity to handle the entire recruitment process.

Nonetheless, the problem currently is that most of the systems implemented today mainly focus on singular HR tasks such as scanning resumes, role-play interview with a virtual bot, or finding and correcting bias in processes. However, even the best ones so far do not integrate the three key players in a single platform which would also

have interviewing and centralized analytics functionalities. This is exactly the issue that this research endeavours to address by tapping into artificial intelligence.

### III. PROPOSED METHODOLOGY

The suggested system proposes an innovative solution by providing a scalable and AI-based

unified platform that helps to integrate students, firms, colleges, and administration in one system for facilitating recruitment and interviews. The methodology is based on real-time interaction, intelligent assessment, and effective data handling through a modular approach.

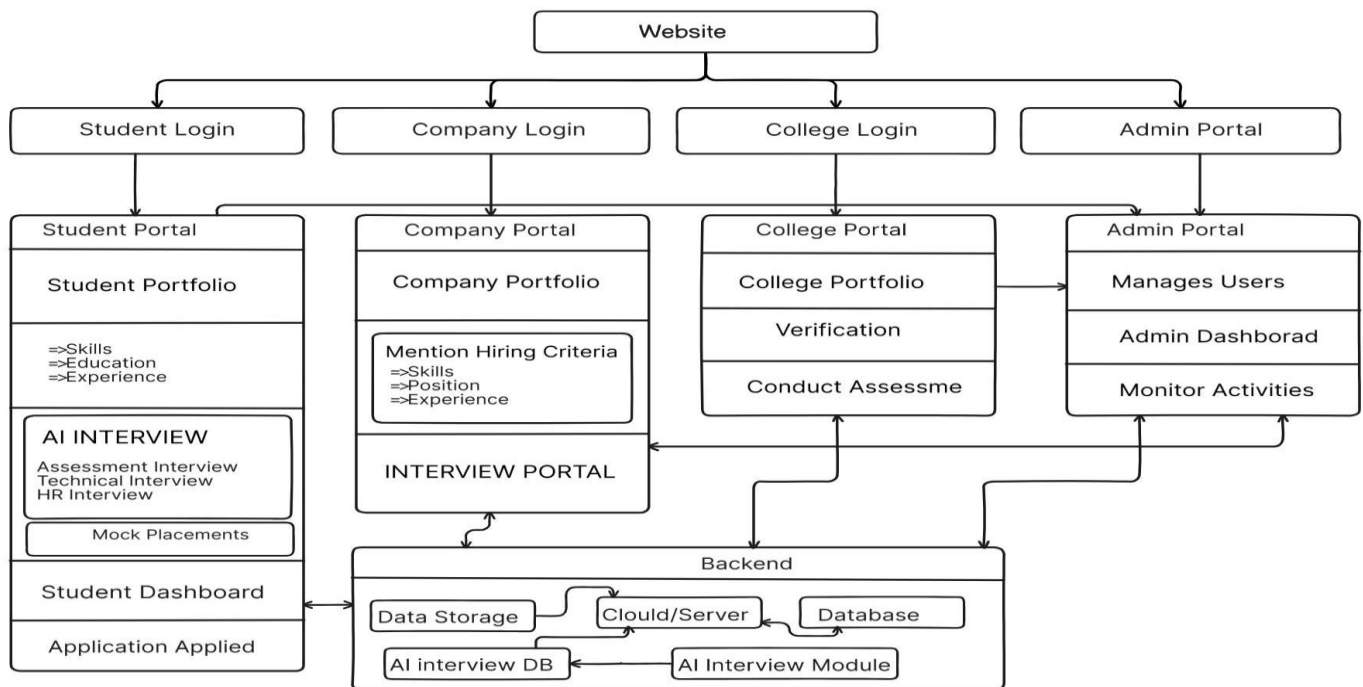


Fig.1 Architecture diagram

#### A. System Design Based on Approach

Our system follows a multitier model that consists of:

1. Presentation Layer (Frontend)
2. Application Layer (Backend & AI Module)
3. Data Layer (Database Systems)

Due to the fact that different layers are independent and communicate with each other through APIs, the system is not only flexible and scalable but also very easy to maintain. This system is implemented using the MERN-P technology stack, where React.js supports the user interface, FastAPI acts as the backend server, MongoDB and Supabase are used for storing data.

#### B. Multi-Portal Interaction Model

The framework consists of four big portals, each one being the major stakeholder's.

**Student Portal:** With this portal candidate can create their profile, attend interview and see their feedback.

**Company Portal:** It is used by recruiting team to set their requirements for the hiring and to get the evaluation of candidates they hired.

**College Portal:** This portal is used by colleges to keep an eye on students, carry out assessments and maintain academic records.

**Admin Portal:** For system-level control, user management and monitoring activities provide the tools. This role-based design makes sure that

interactions between all the users are safe and very efficient.

### C. Workflow of the Proposed System

The method works in a step by step manner as depicted below:

**Step 1: User Authentication** All the users that register on the system are required to log in through a secured authentication system. First of all a role-based access control will assure that each user is accessing only allowed functionalities.

**Step 2: Profile Management** Students fill out their profiles with information such as skills, education, and experience. On the other hand, Companies identify the roles and hiring requirements which are, in fact, the basis of the interview questions customization.

**Step 3: Interview Scheduling and Initialization** Students are able to start AI-powered interview sessions from their portal. The system afterward determines the appropriate interview type among (technical, HR, or assessment) and draws up a set of questions applicable to the candidate's profile.

**Step 4: Real-Time Interview Execution** Interviews are conducted live either by text or through voice. Advanced communication ensuring technologies like WebRTC are employed to bring about virtually no delay in the interaction.

**Step 5: AI-Based Response Processing** The AI one processes the candidate's answer with the help of NLP tools.

- Semantic correctness
- Relevance to the question
- Language clarity and fluency
- Confidence and response structure

**Step 6: Scoring and Feedback Generation**

Each response is assigned a score based on predefined metrics. The system generates:

- Parameter-wise scores

- Overall performance rating
- Personalized improvement suggestions

**Step 7: Data Storage and Synchronization**

- Unstructured data (responses, feedback) is saved in MongoDB
- Structured data (user details, roles) is saved in Supabase
- Data consistency is preserved between both databases

**Step 8: Analytics and Reporting** Different sets of performance data are illustrated through student-, college- and company-oriented dashboards. Such a platform not only aids monitoring of the learners' progress and deciphering of their strengths and weaknesses but also serves as a tool for making wise educational choices.

### D. AI Interview Processing Model

The AI component of the system goes through a series of steps in a structured way.

1. First step - Capture the candidate's responses (text/voice)
2. Voice/text - In speech-to-text conversion and other data cleansing
3. Key information discovery - Identify keywords, context, and intent
4. Response Judging - Using NLP models to compare candidate answers with expected answers
5. Grading System - Derive test scores from performance metrics
6. Commentary - Offer detailed advice on how to improve This "pipeline" method of evaluating candidates ensures doing so correctly and in a uniform manner.

**E. Data Management Strategy A hybrid data storage approach is adopted:**

**MongoDB:** A database that works well with messy information like notes from interviews or comments made by artificial intelligence tools is MongoDB. It stores details without needing a strict format, so changes are easier to manage over time.

**Supabase:** Manages structured data including authentication, user roles, and relational records.

This mix keeps data work smooth while holding things steady. What you get is movement without losing grip on what matters.

## F. Security and Privacy Mechanisms

- To ensure secure system operation:
  - Role-based authentication is implemented
  - Sensitive data is encrypted

Access control mechanisms prevent unauthorized usage. Firm connections guard data exchanges. Messages travel through protected channels. These links keep information safe. Protection wraps every digital handoff. Safety lives in each signal passed.

## G. Scalability and Performance Considerations

Few tools manage big rollouts like this one does. Built right from the start for heavy loads. Handles growth without skipping steps. Works smoothly when used widely. Ready whenever demand climbs fast.

- Asynchronous backend processing (FastAPI)
- Efficient handling of concurrent users
- Load balancing for AI modules.
- Cloud-based infrastructure support.

## H. Advantages of the Proposed Methodology.

- Enables real-time AI-driven interviews.
- Reduces manual effort in recruitment.
- Ensures unbiased and consistent evaluation.
- Provides centralized data management.
- Enhances scalability and system performance.

## I. Mock Placement Module in Student Portal

- The student portal has a detailed mock placement module, which comprises the following parts:
  - Aptitude Test: Measures logical reasoning, quantitative skills, and problem-solving ability.
  - Technical MCQ Test: Evaluates knowledge of the domain through multiple choice questions.
  - Coding Test: Checks the programming and problem-solving skills with coding challenges.
  - AI-Based Interview: Performs live interview mimic and rates the aspects of communication, technical know-how, and confidence.

Such module delivers a thorough evaluation of the applicants and assists students in gearing up for actual placement situations.

## IV RESULTS

The proposed AI-based recruitment platform has been designed and implemented successfully to test its performance in real-time interview simulation, automated assessment, and multi-user interaction. The results show the system's effectiveness, scalability, and reliability.

### A. System Implementation Results

The system was rolled out with several functional modules such as Student Company College, and Admin portals. Each module functioned accurately with easy navigation and role-based access control was implemented.

- Users was able to register, login and access to their respective dashboards without any problems.
- The portals provided a very smooth interaction and very efficient the handling of data.
- Interview sessions were done with real-time communication and minimal latency



Fig.2 Homepage: The screenshot shows a website that helps colleges and companies work together. It is called "Connecting Colleges & Companies Seamlessly". This website wants to make it easy for colleges and companies to talk to each other. There are three kinds of users, for this website: Company, College and Student. Each of these users can log in.

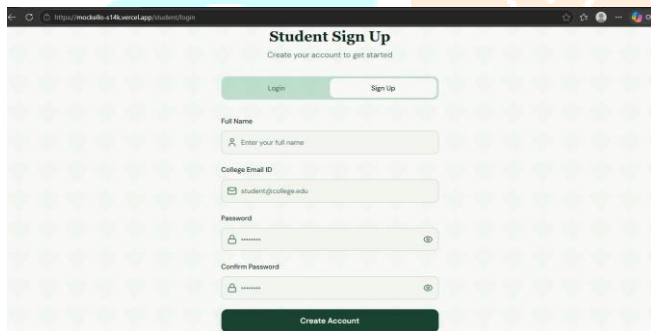


Fig.3 Sign UP Page: The screen shows a Student Sign Up interface belonging to an AI recruiting system. This allows users to fill in their names, college emails, and passwords to create accounts. There is a simple interface which has the ability to sign in and register, as well as create accounts.

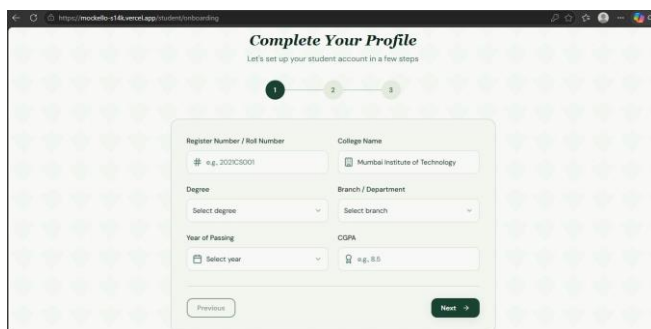


Fig.4 Registration: The screenshot shows a **Complete Your Profile** page where users fill in academic details. It includes fields like register

number, college name, degree, branch, year of passing, and CGPA. The step-based form helps users complete their profile before proceeding.

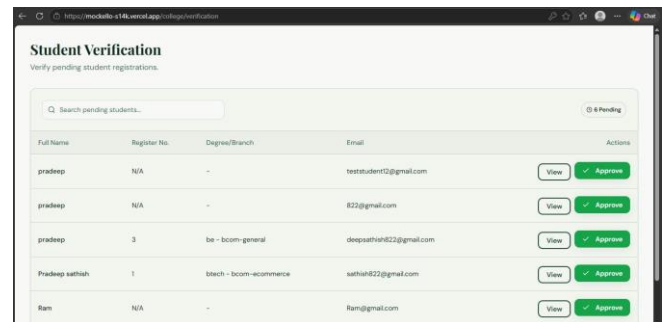


Fig.5 Approved From College portal: The screenshot shows a **Student Verification** page used to review student details. It lists student information like name, register number, email, and department. Admins can approve or view each student using action buttons.

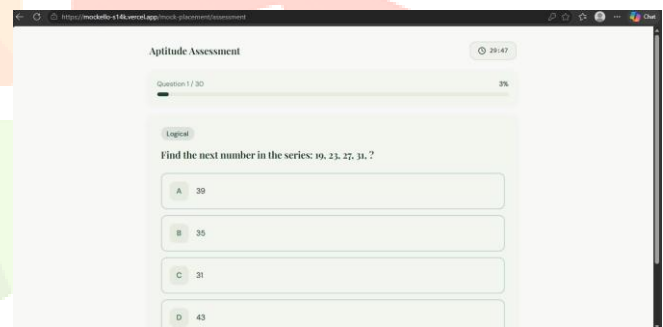


Fig.6 Mock Test: Mock test were conducted for students.

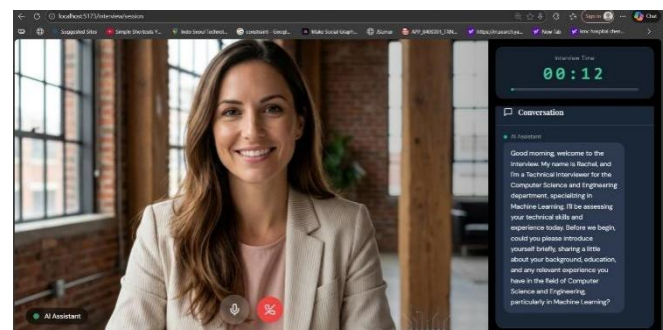


Fig.7 One way AI interview: A **one-way interview** is a type of interview where candidates record their answers to pre-set questions without interacting with a live interviewer.

They are given a time limit to think and respond, and the recordings are reviewed later by recruiters. It is commonly used in AI-based recruitment systems for quick and flexible candidate screening.

## B. AI Interview Performance

The AI Interview Module will carry out automated interviews and assess candidate answers.

The domain and profile were dynamically used to generate questions. The system handled both text and voice response modes. AI assessment gave a breakdown considering:

- Technical skills
- Communication skills
- Confidence and clarity

The generated feedback was not only relevant but also helped in mapping the candidate's strengths and weaknesses.

## C. Accuracy and Evaluation Efficiency

- The AI model has been able to carry out performance evaluation with consistent accuracy:
- Effectively detected the main keywords and concepts
- Scored logically based on the preset evaluation criteria. Compared to manual evaluation, bias was significantly reduced.

Automated system has drastically cut down evaluation time as compared to conventional methods.

- Figure 8 shows the comparative analysis between students' performances in various attempts of interviews conducted with and without the aid of AI-enabled interviews..

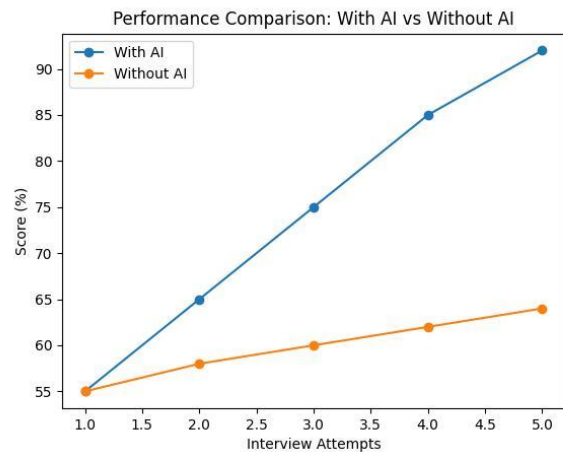


Fig. 8: Improvement in Student Performance Using AI-Based Interview System.

It is quite clear that students who have used the AI-supported interview system have made marked improvement in their performance as far as succeeding attempts are concerned. They were able to score from 55 percent to 92 percent in five attempts due to constant feedback and individual evaluation. On the other hand, students without AI have improved marginally with scores ranging from 55 percent to 64 percent.

## Improvement in Student Performance Using AI-Based Interview System

| Interview Attempt | Score (%) | over Previous Attempt (%) | Cumulative Improvement (%) |
|-------------------|-----------|---------------------------|----------------------------|
| 1                 | 55        | -                         | -                          |
| 2                 | 65        | +10                       | +10                        |
| 3                 | 75        | +10                       | +20                        |
| 4                 | 85        | +10                       | +30                        |
| 5                 | 92        | +7                        | +37                        |

Table 1: Improvement in Student Performance Using AI-Based Interview System.

The table shows the progressive improvement in student performance across multiple interview attempts. It is observed that the score increases from 55% in the first attempt to 92% in the fifth attempt, demonstrating the effectiveness of AI-based feedback and continuous learning.

| Feature           | Traditional System | Proposed System         |
|-------------------|--------------------|-------------------------|
| Interview Process | Manual             | AI Automated            |
| Evaluation        | Subjective         | Objective & Data-driven |
| Feedback          | Limited            | Instant & Detailed      |
| Scalability       | Low                | High                    |
| Data Management   | Fragmented         | Centralized             |

#### D. System Performance and Scalability

- The backend developed with FastAPI was able to efficiently manage a large number of users accessing the system simultaneously: Asynchronous programming was used that enabled the system to run multiple interview sessions in parallel without any delay.
- The system was still working fine with a reasonable number of users. The database was accessed very quickly thanks to the optimized read/write operations. So the system can handle a lot of users especially at peak times (such as placement periods).

#### E. Data Management Results

The hybrid database implementation worked very well:

- MongoDB was used to store interview records and other semi-structured data.
- Supabase was responsible for highly structured data such as authentication and user roles.
- Data consistency and synchronization were ensured throughout the system.

#### F. User Experience and Usability

- The system gave an intuitive and friendly interface:
- Students appreciated the AI interviews as a tool to practice and enhance their skills.
- Companies got instant access to candidate performance data.

- Admins had powerful tools to track and control system operations. The platform in general contributed to better user engagement and usability.

**Table 2:**Comparative Analysis

### V CONCLUSION

In this paper, a conceptual design and prototype of an AI-powered unified platform that links students, colleges, and companies into one recruitment ecosystem seamlessly was presented. The system proposed in this study is capable of mitigating some of the challenges of the traditional placement processes like scattered communication, manual evaluation, and lack of standardized assessment.

The platform, through the incorporation of an AI interview module, facilitates not only live interview simulation but also automatic evaluation of candidate performance with reference to technical knowledge, communication skills, and confidence. The adoption of contemporary technologies including React.js, FastAPI, MongoDB, and Supabase guarantees a scalable, high-performing, and secure system infrastructure.

The platform, in fact, demonstrates that it is possible to attain more efficient recruitment processes, significantly less manual work, and fair evaluation as compared to the traditional ways. Besides, stakeholders' collaboration is further fostered by a multi-portal system and the performance of candidates can be tracked through an analytics component. To sum up, the system introduced is a dependable, scalable, and smart platform that meets the criteria for today's recruitment demands and may therefore be considered for actual use in both educational institutions and business environments.

### IV REFERENCES

- [1] Springer Nature (Systematic Review), Role of artificial intelligence in employee

- recruitment: systematic review and future research directions — Springer, published 05 September 2025..
- [2] Harsh Koshti, Prathamesh Gosavi, Roshan Pagar, et al., AI-Powered Interview Preparation System: Integrating Resume Analysis, HR Simulation, and Technical Skill Assessment — Journal of Engineering Research and Reports, May 2025.
- [3] Dena F. Mujtaba & Nihar R. Mahapatra, Behind Screens: Uncovering Bias in AI-Driven Video Interview Assessments Using Counterfactuals — arXiv 2025.
- [4] Authors from SJM Institute of Technology, AI-Powered Mock Interview Platform with NLP and Speech Analysis - 2024
- [5] Automatic Skill-Oriented Question Generation and Recommendation— ACM (2025).
- [6] A Systematic Review of AI-Driven Interviewing Systems for Technical and Professional Skills— ISCAP Proceedings, 2025.
- [7] Role of Artificial Intelligence in Employee Recruitment: A Systematic Review and Future Research Direction set al., 2023.
- [8] Artificial Intelligence in Recruitment: A Review of Trends and Implications Upadhyay & Khandelwal, 2018
- [9] AI-Powered Interview Preparation System: Integrating Resume Analysis, HR Simulation, and Technical Skill Assessment Harsh Koshti et al., 2024
- [10] BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding Jacob Devlin et al., 2019.
- [11] Language Models are Few-Shot Learners Tom B. Brown et al., 2020.
- [12] Conversational AI: Dialogue Systems, Conversational Agents, and Chatbots McTear et al., 2016.
- [13] On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? Emily M. Bender et al., 2021V.
- [13] HireVue AI-Based Interview Assessment and Its Impact on Recruitment Efficiency Chamorro-Premuzic, T., Winsborough, D., Sherman, R., & Hogan, R., 2016.
- [14] Deep Learning for Natural Language Processing in Recruitment Systems Young, T., Hazarika, D., Poria, S., & Cambria, E., 2018.