



International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

AI Placement Mentor

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ABSTRACT

Analysis, The AI Campus Placement Mentor is a smart web application that supports students to get ready for campus placements. This system makes use of Artificial Intelligence (AI), Retrieval-Augmented Generation (RAG), Natural Language Processing (NLP), and Large Language Models (LLMs) to give personalized placement guidance. It assists students in checking company eligibility, resume analysis, calculating ATS score, skill gap analysis, developing personalized learning paths, practicing interviews questions, and clearing placement doubts with the help of the AI chatbot. The RAG approach helps in fetching information about company eligibility, college placement policies, previous interview questions, aptitude questions, and resume guide before generating answers. The development of the application involves React.js in the frontend, Node.js and Express.js in the backend, MongoDB for managing the database, and Python along with LangChain for AI and RAG operations. FAISS or ChromaDB can be used as the vector database, whereas LLMs like Llama or GPT can generate natural language responses. The suggested system provides students with personalized and accurate placement assistance using one platform.

KEYWORDS: *artificial Intelligence, RAG, Large Language Model, LangChain, Resume ATS Score, Placement Assistance, Skill Gap Analysis, React.js, MongoDB*

INTRODUCTION

Campus placement is an important phase in the life of any student. However, many students experience problems related to understanding company requirements, resume creation, skill gap identification, and interview preparation. Moreover, placement information is scattered across multiple sources, which makes it hard to find relevant data quickly

The AI Campus Placement Mentor is suggested as a smart web application that will give personalized placement guidance from a single platform. The application will combine Artificial Intelligence (AI), Natural Language Processing (NLP), Retrieval-Augmented Generation (RAG), and Large Language Models (LLMs) to help students prepare for placement.

The application will allow users to upload their resumes and get resume analysis and ATS scoring. The system will also be able to check company eligibility, identify skill gaps, and make personalized learning suggestions. The RAG-based assistant will retrieve relevant information like company requirements, placement rules, interview questions, aptitude materials, resume guidelines, etc., before responding.

The application will have skill gap analysis, personalized learning roadmaps, AI interview questions, and placement chatbot. React.js, Node.js, Express.js, MongoDB, Python, LangChain, FAISS/ChromaDB technologies will be used to develop the system.

Literature Survey/Review

Previous work reveals that AI, NLP, and Machine Learning could be employed to help students with career guidance and placement preparations. AI-based systems can study the student's profile and resume to know about the skills and give career suggestions.

The emergence of Large Language Models (LLMs) has helped AI-based systems to comprehend the natural language query and respond to it. However, general LLMs might not always give the answer keeping in mind the requirements of the particular company or college placements.

Retrieval Augmented Generation (RAG) can solve this problem by retrieving the information from the knowledge base before answering. It can be implemented in the placement system with the help of sources like company eligibility criteria, interview questions, aptitude materials, and resume guidelines.

It is evident from the literature survey that most of the previous work done in this area is based on individual features like resume analysis, job recommendations, or interviews. Hence, the proposed AI Campus Placement Mentor brings all these features together in one platform through RAG-based retrieval.

Methodology

Methodology for AI Campus Placement Mentor includes the design and integration of different modules that can give personalized placement support. The process begins with student registration and resume uploading wherein the system will collect information regarding the student's education, skills, projects, and experience.

The second step involves analyzing the resume to get an ATS score and find out what the strengths and missing skills of the student are. Then the system compares the student profile with the eligibility criteria of companies to find out the right placement options for him.

As far as the AI-based assistance is concerned, the information regarding placements, including company requirements, college placement policies, interview questions, aptitude questions, and resume writing tips, is stored in the knowledge base. Relevant information is retrieved with the help of RAG via vector databases like FAISS or ChromaDB and delivered to the LLM.

Finally, the system gives a skill gap analysis, personalized learning path, AI interview questions, and chatbot assistance. The frontend is built on React.js, while Node.js, Express.js, and MongoDB take care of the backend and database.

CONTENT

AI Placement Mentor is a one-stop application for various placement functions within the student. The app encompasses resume evaluation, ATS scoring, company eligibility checker, skills gap analysis, custom learning roadmaps, AI interviews and preparation, and placement bot. All the modules have been developed in order to provide the personalized and simplified guidance to the user. The app also works with RAG to fetch the required company and placement information before providing the answer..

Table1: Overview of key features implemented in Ai placementmentor

Feature	Description	Technology used
Resume Analysis	Analyzes student resume and identifies skills, projects, and experience.	Python, Nlp
ATS Score	Evaluates the resume based on job requirements	Python, NLP
Company Eligibility	Checks whether a student meets specific company requirements.	Node.js, MongoDB
Skill Gap Analysis	Identifies missing skills and areas for improvement	AI, LLM
Personalized Roadmap	Provides a learning plan based on the student's skill gaps.	AI, langchain
Placement Chatbot	Answers student queries related to placements.	NLP, LLM
AI Interview	Generates interview questions for placement practice	LLM, python

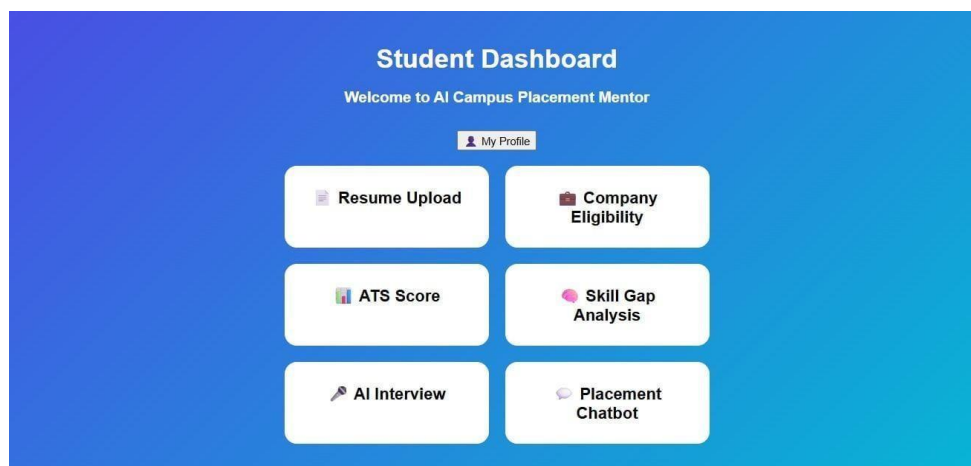


Fig. 1: AI Campus Placement Mentor output illustrating personalized placement guidance and recommendations

Research and Reviews:

According to previous research, Artificial Intelligence, Machine Learning, NLP, and Large Language Models can help students in providing them guidance in careers, resumes, and interview preparations. Such systems can analyze student profiles and make appropriate recommendations based on their skills and careers goals.

Research on Retrieval-Augmented Generation (RAG) reveals that retrieving appropriate information from a knowledge base to generate an answer increases the level of relevance in answers provided by AI models. In the case of placements, such systems are useful since different requirements, including those related to companies, rules of placements, interviews, and aptitudes, have to be taken into account.

It is known that the reviews on existing career and placement systems reveal that there are numerous platforms which are focused on specific features such as resume check, job recommendations, or interview training. AI Campus Placement Mentor includes all those features in its work process.

Results & Discussion

Analysis of the AI campus placement mentor shows that the platform is capable of providing useful placement services through a single system. The resume analysis tool allows students to know what skills, qualifications, and experience they possess, whereas the ATS score indicates how compatible their resume is with job vacancies.

The company eligibility and skill gap analysis tools help students find companies they are eligible for and know which skills they should enhance. The RAG-based assistant will be able to obtain company requirements, placement guidelines, interview questions, and other materials to provide more context-oriented answers. There are also interview and placement chatbot modules to help the student.

There are several limitations of the system. First, the reliability of AI-generated answers depends on the relevance and availability of the data in the knowledge base. Secondly, resume analysis and ATS scores may require further improvement using larger databases and better algorithms. Overall, the proposed system is a good foundation for personalized placement preparation, whereas the improvements of the platform will allow making it more accurate and efficient..

Discussion

Thus, the use of the developed AI Campus Placement Mentor gives a detailed idea about the implementation of AI in placement preparation. Students no longer need to get resumes, company information, interview questions, and skill preparation from different sources but can obtain all these features using one platform.

One of the key findings related to the use of the platform is that the implementation of the RAG technology will help provide personalized answers with the help of the information from the knowledge base about placement.

In conclusion, it should be noted that the development of the AI model gives an opportunity to implement a practical campus placement preparation system. The system can be further improved due to the quality data, better AI models, databases about companies, and support of multiple languages.

CONCLUSION

The AI Campus Placement Mentor is an AI-based system which aims to assist the students in preparing themselves for campus placements. The system offers various functionalities including resume assessment, ATS score generation, company eligibility assessment, skill gap analysis, learning roadmap and AI-based interview preparation.

With the integration of Retrieval-Augmented Generation (RAG), the system fetches the relevant company and placement details before generating its response. Thus, the guidance becomes more relevant and personalized. The proposed system serves as a central and convenient platform for the students to improve their skills and become placement-ready..

Future Scope

Future scope of the AI Campus Placement Mentor includes improving it by adding more company databases and real-time updates about placements. Better resume analysis and ATS scoring can be achieved by training with more data. There could be inclusion of mock interviews for analyzing speech of the students using AI technology. Interaction with voice and better support for Tamil and other languages can also be introduced in the application. Other improvements could be in the form of real-time job recommendation, progress tracking and career guidance.

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