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PlaceMe: An Integrated Campus Recruitment Platform

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Abstract: ***PlaceMe: An Integrated Campus Recruitment Platform aims to streamline and modernize the recruitment process for educational institutions by integrating machine learning-driven recommendations with dynamic industry skill updates. Traditional placement prediction systems rely on static datasets that quickly become outdated due to the ever-evolving nature of the IT and job market. To address this, PlaceMe introduces an admin-controlled interface where industry-specific skill requirements can be regularly updated via file uploads. This allows for real-time retraining of the machine learning model, ensuring that student skill-gap analysis and recommendations remain aligned with current market demands. The platform automates the entire campus recruitment workflow—from job application submission to sending congratulatory emails upon selection—thereby reducing manual effort and ensuring transparency. By combining dynamic skill management with a smooth recruitment experience, PlaceMe empowers students with actionable insights and institutions with an efficient, scalable recruitment solution.***

Keywords: Campus Recruitment Platform, Resume Parsing, Skill Extraction, Student Profiling, Machine Learning, Natural Language Processing (NLP), Random Forest, Predictive Analytics, Automated Matching, Dynamic Skill Update, Career Recommendation System.

I. INTRODUCTION

In today's rapidly evolving job market, staying aligned with industry requirements has become a significant challenge for both educational institutions and students preparing for placements. The traditional campus recruitment process is often fragmented, inefficient, and heavily reliant on outdated or manual procedures. Moreover, many machine learning models used in existing student-job matching systems depend on static datasets for analysing student skills and predicting placement opportunities. These static models quickly become obsolete as industry demands shift, especially in dynamic fields like Information Technology, where required skill sets are constantly changing. To address these pressing challenges, we propose PlaceMe: An Integrated Campus Recruitment Platform. PlaceMe is a centralized, intelligent system designed to automate and optimize the entire recruitment lifecycle—from student registration and job application to shortlisting, interview scheduling, and final placement. One of the standout features of PlaceMe is its intelligent skill comparison engine, powered by machine learning. Unlike conventional systems, PlaceMe allows administrators to actively update job role-specific skills through a user-friendly admin interface. Admins can upload files containing updated skill requirements, which are then used to retrain the machine learning model in real time. This ensures that the system remains relevant and continues to provide accurate, data-driven recommendations to students about how they can bridge their skill gaps and improve their employability. Furthermore, PlaceMe enhances the recruitment experience by sending timely email notifications, including congratulatory messages when students are shortlisted or selected. The system ensures a seamless flow of communication between students, companies, and placement officers while minimizing administrative overhead. It also provides valuable insights through analytics, helping institutions monitor placement trends, student performance, and company engagement.By integrating dynamic machine learning capabilities with a comprehensive recruitment workflow, PlaceMe not only improves placement outcomes but also fosters a proactive learning environment where students are guided toward in-demand skills. This platform is a step forward in making campus recruitment smarter, more transparent, and responsive to the needs of the modern job ecosystem.

A. Terminologies of Intelligent Campus Recruitment Platform

To better understand the working and objectives of *PlaceMe*, it is important to clarify some key terminologies used throughout the system:

- Campus Recruitment Platform: A digital system designed to facilitate the end-to-end recruitment process within educational institutions, including student registration, job posting, application tracking, shortlisting, and final selection.

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- Resume Parsing: The process of automatically extracting structured information (such as skills, education, and project experience) from unstructured student resumes using Natural Language Processing (NLP) techniques.
- Skill Extraction: A specialized NLP technique that identifies and extracts relevant skills mentioned in a student's resume to compare them with the required skills for a specific job role.
- Dynamic Skill Update: A functionality that allows administrators to upload new job role-based skill sets to keep the system aligned with evolving industry standards. The updated data is used to retrain the machine learning model.
- Student Profiling: Building a digital representation of a student based on their academic records, projects, certifications, and resume content for better candidate-job matching.
- Machine Learning (ML): A subset of artificial intelligence used to build predictive models for tasks such as placement prediction and skill recommendations. In this system, algorithms like Random Forest are employed.
- Random Forest Algorithm: A supervised learning algorithm used for classification and regression tasks. In *PlaceMe*, it predicts a student's placement probability or job suitability based on multiple input features.
- Natural Language Processing (NLP): A field of AI that enables machines to understand, interpret, and extract meaningful data from human language. NLP is used here to analyse student resumes.
- Predictive Analytics: The use of data, statistical algorithms, and ML techniques to predict future outcomes. PlaceMe applies predictive analytics to forecast a student's chances of being shortlisted based on their profile.
- Admin Panel: A secure interface where administrators can manage job postings, update skill sets, upload datasets, retrain models, and oversee the overall recruitment process.
- Job Role Matching: The process of aligning student profiles with job descriptions based on skill compatibility, educational background, and project experience.

II. LITERATURE SURVEY

1) Student Placement Prediction and Skill Recommendation System using Machine Learning Algorithms (2024): In the paper titled Student Placement Prediction and Skill Recommendation System using Machine Learning Algorithms by Rakesh Kadu (2024), the author discusses the growing potential of machine learning in optimizing recruitment and placement systems, particularly within the context of campus recruitment. Traditional methods of recruitment often struggle with limitations such as a lack of real-time data, personalized skill recommendations, and challenges in aligning students with appropriate career opportunities based on their strengths and goals. The author presents a solution through the use of machine learning algorithms, specifically focusing on the Random Forest algorithm, to predict placement probabilities. These predictions are based on various student attributes, including academic performance, internship experience, certifications, aptitude scores, and soft skills. By utilizing this approach, the system aims to assist students in identifying areas for skill improvement and in developing more effective job search strategies. The system's ability to predict placement outcomes is particularly notable, as it provides students with a data-driven insight into their employability. The use of machine learning enables the identification of strengths and weaknesses, guiding students toward the necessary skills for career advancement. This approach not only aims to enhance placement rates but also contributes to the development of a more efficient and personalized recruitment process, offering valuable recommendations to students on how to bridge skill gaps and align with industry demands. By incorporating these machine learning techniques, the author's system showcases the potential for creating a more dynamic and informed recruitment environment, ultimately improving students' chances of securing placements in a competitive job market.

2) On Campus Student Recruitment Analysis using Machine Learning techniques (2023): In the paper titled On Campus Student Recruitment Analysis using Machine Learning Techniques by Varsha T. (2023), the author discusses the transformative potential of machine learning in automating and enhancing the accuracy of student placement assessments in online recruitment, particularly within the academic sector. As IT organizations increasingly conduct online hiring, colleges and other nonprofit institutions play a pivotal role in managing student career development and placement services. However, the challenge of processing large numbers of student applications to match varying company requirements remains a significant hurdle. The paper emphasizes the importance of intelligent recruitment systems that leverage machine learning to process and assess student applications efficiently. Techniques like random forest, logistic regression, and linear regression are highlighted as valuable tools for automating the comparison of student qualifications against company requirements. By analyzing a student's academic performance, test scores, internship experiences, and skill sets, these models can predict suitability for specific roles, thereby narrowing down candidate pools and easing the workload of recruitment teams. The author's approach

aims to improve the recruitment process by offering a system that not only evaluates students' qualifications but also provides personalized recommendations to help students bridge skill gaps, ultimately enhancing employability. The use of cloud-based architecture facilitates real-time interaction between placement coordinators, recruiters, and students, ensuring that all parties have access to up-to-date information. Through the integration of various machine learning methods, the system described in the paper allows for an adaptable and automated approach to recruitment, where student profiles are benchmarked against company standards. This approach significantly reduces manual effort, increases recruitment accuracy, and provides a more efficient solution for modern academic recruitment processes.

3) Integrated Webapp for Campus Placement (2023): In the paper titled Integrated Webapp for Campus Placement by M. Sinthuja (2023), the author discusses the complexities involved in managing student placements and recruitment processes at academic institutions, highlighting the challenges posed by the lack of a unified platform to streamline interactions between students, companies, and placement departments. Traditional placement systems often require students to repeatedly submit their information to multiple companies, creating inefficiencies. The placement department also faces difficulties in manually verifying and tracking each student's status. Furthermore, companies rely on placement departments to communicate selected candidates for further recruitment processes, leading to delays and communication gaps. To address these issues, the paper emphasizes the development of centralized platforms that can integrate various components of the placement process into one unified system. By doing so, the platform can reduce redundancies, enhance operational efficiency, and ensure smoother communication between all parties involved. Students can register, submit updated profiles, and access multiple job opportunities from different companies in a single platform. This eliminates the need for repetitive submissions and allows students to track their progress across various job openings. Placement departments benefit from the system's automation capabilities, which allow for easier approval or rejection of student profiles and the automatic dissemination of job details to relevant candidates. The proposed platform, as discussed in the paper, is designed to meet the needs of three primary user groups: administrators, companies, and students. Each group is given tailored access to features that suit their specific needs. For instance, administrators can manage the approval process and oversee job postings, while companies can quickly access applications for relevant positions. Students, on the other hand, can track job openings and update their profiles as needed. The platform is built using modern web technologies such as React JS for the frontend, which ensures an interactive and responsive user interface. On the backend, Node JS is used for server-side scripting and integration, while MongoDB with Mongoose is employed for database management, ensuring scalability and flexibility in handling large amounts of data. Redux is incorporated for state management, enabling seamless data flow throughout the application, and Axios is utilized for efficient API requests, ensuring quick communication between the frontend and backend. This combination of technologies not only improves the platform's responsiveness but also guarantees secure and efficient data handling. Sinthuja's research highlights how the integration of modern web technologies and database frameworks into a campus placement platform can significantly reduce administrative overhead and manual intervention. It can also enhance the communication and interaction between students, companies, and placement departments, ultimately leading to a more streamlined and effective recruitment process. This centralized approach is positioned as a solution to the inefficiencies of traditional recruitment systems, offering a more scalable, automated, and user-friendly platform for managing campus placements.

4) Online Training and Placement System (2023): In the paper titled Online Training and Placement System by Gunjan Jewani (2023), the author proposes a solution aimed at simplifying and optimizing the campus placement process. The proposed system focuses on improving the efficiency of both the student registration process and the management of student data by placement officers. It provides a streamlined approach to quickly identify qualified students, informs them of placement opportunities, and tracks successful placements. This enables placement officers to make more informed decisions and speeds up the entire recruitment cycle. One of the key features of the system is its ability to manage placement schedules effectively. Placement officers can create and organize events like interviews, skill development workshops, and company presentations, ensuring smooth coordination between students, recruiters, and faculty. The system also automates notifications, alerting students when they meet the necessary criteria for placement, thereby reducing the manual workload for placement officers. Furthermore, the centralized storage of student data facilitates future recruitment processes, training activities, and alumni engagement, making the system a comprehensive tool for managing placement operations. In addition to these features, the platform offers powerful data analytics tools that track the success of placements and provide insights for continuous improvement. By minimizing paper-based efforts and providing default forms for managing company data, the system enhances communication between students, placement officers, and companies, ensuring that all relevant information is securely stored for future use.

III. METHODOLOGY

The methodology adopted for *PlaceMe* is centered around building an intelligent, scalable, and dynamic platform that enhances the campus recruitment experience using machine learning and Natural Language Processing (NLP). The system is developed through the following stages:

A. Data Collection and Preprocessing

The system begins by collecting structured and unstructured data from students, including:

- Academic records
- Certifications and achievements
- Project descriptions
- Uploaded resumes (in PDF or DOCX format)

Natural Language Processing (NLP) techniques are applied to preprocess resumes. This includes:

- Text extraction
- Tokenization
- Stop-word removal
- Named Entity Recognition (NER)

These steps enable effective parsing and extraction of important features such as **skills**, **projects**, **educational qualifications**, and **internship experiences**.

B. Skill Extraction and Feature Engineering

Extracted resume information is transformed into structured data fields. The key features used for training the machine learning model include:

- Skill vectors
- CGPA or percentage
- Project relevance
- Internship duration
- Certifications

NLP models are used to map extracted skills with those in the job role descriptions. A skill-gap analysis is also performed to identify missing or desirable skills.

C. Admin Skill Update and Model Retraining

A dedicated admin interface is provided where the admin can:

- Upload updated job-role-based skill sets (in CSV/JSON format)
- Trigger model retraining based on the new dataset

This dynamic skill update mechanism ensures that the system adapts to changing industry needs, keeping the prediction and recommendation engine current and relevant.

D. Model Training and Prediction

A Random Forest classifier is trained using the extracted features to:

- Predict the probability of a student being shortlisted for a job
- Recommend roles based on profile-to-job compatibility

Random Forest was selected due to its high accuracy, robustness to overfitting, and ability to handle high-dimensional data.

E. Job Matching and Recommendation Engine

The system evaluates a student's profile against job requirements using a weighted scoring mechanism based on:

- Skill match percentage
- Academic eligibility
- Experience relevance

This score determines job recommendations for the student and helps recruiters quickly identify suitable candidates.

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F. Notification and Workflow Automation

To streamline communication:

- Students receive automated email notifications after applying, shortlisting, or selection.
- The platform provides dashboards for students, recruiters, and placement coordinators to monitor progress.

G. Deployment and Testing

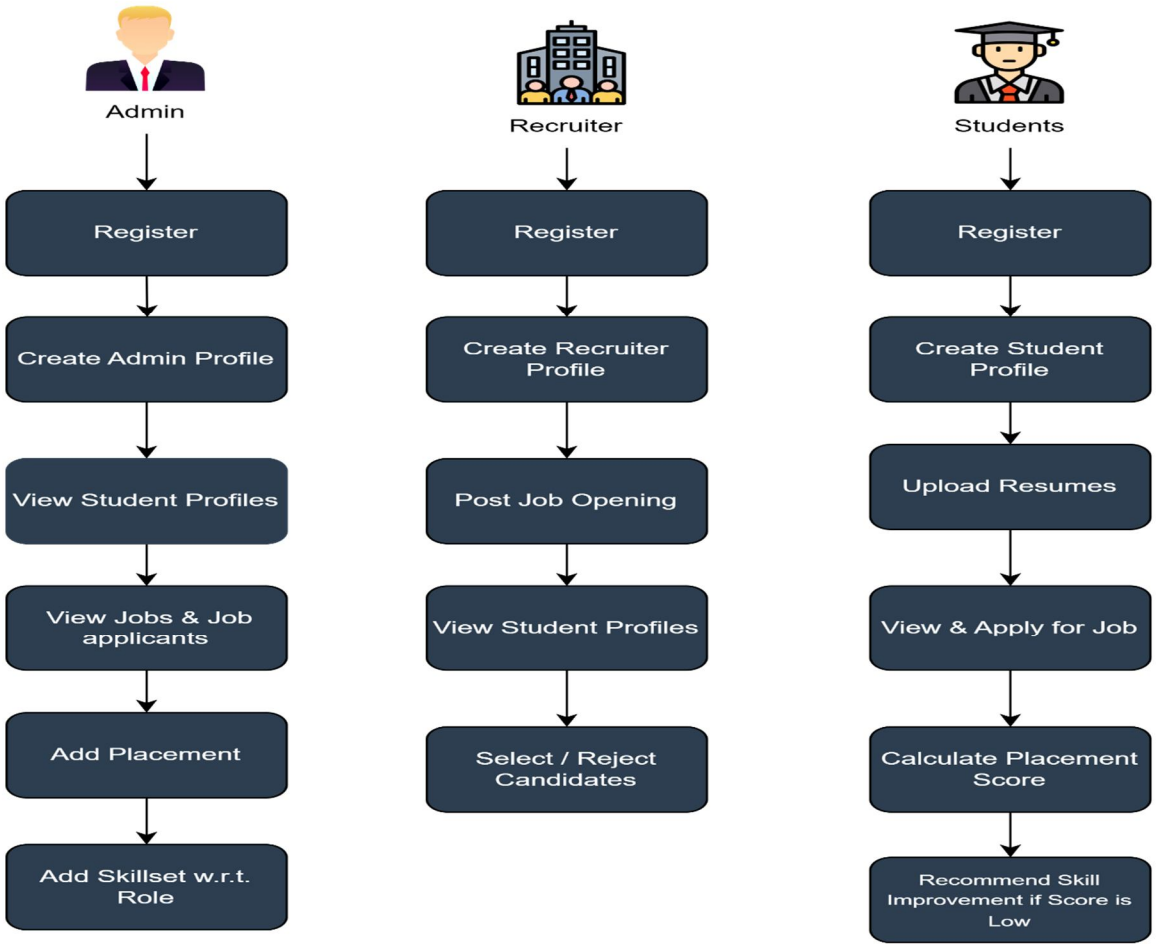
The system is deployed on a cloud-based infrastructure, ensuring scalability and 24/7 accessibility. Comprehensive testing is conducted to ensure:

- Functional accuracy
- Resume parsing robustness
- Model prediction reliability
- UI responsiveness

This methodology ensures that *PlaceMe* is not just a job-matching platform but a smart, evolving ecosystem that bridges the gap between student capabilities and industry expectations.

IV. IMPLEMENTATION DETAILS

A. Modular Workflow for Role-Based Campus Recruitment System



This flowchart visually represents the role-based workflow in a Campus Recruitment Management System, which includes three primary roles: Admin, Recruiter, and Student. Each user type performs specific tasks as part of the placement process.

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1) Admin Module

- *Register: Admin creates an account on the platform.*
- *Create Admin Profile: Admin completes the profile setup.*
- *View Student Profiles: Admin can access student information and resumes.*
- *View Jobs & Job Applicants: Admin monitors job postings and student applications.*
- *Add Placement: Admin updates placement status for selected students.*
- *Add Skillset w.r.t. Role: Admin inputs or updates the required skillsets for various job roles. These skillsets help define what recruiters look for, and assist in scoring or recommending skills to students based on their resume data.*

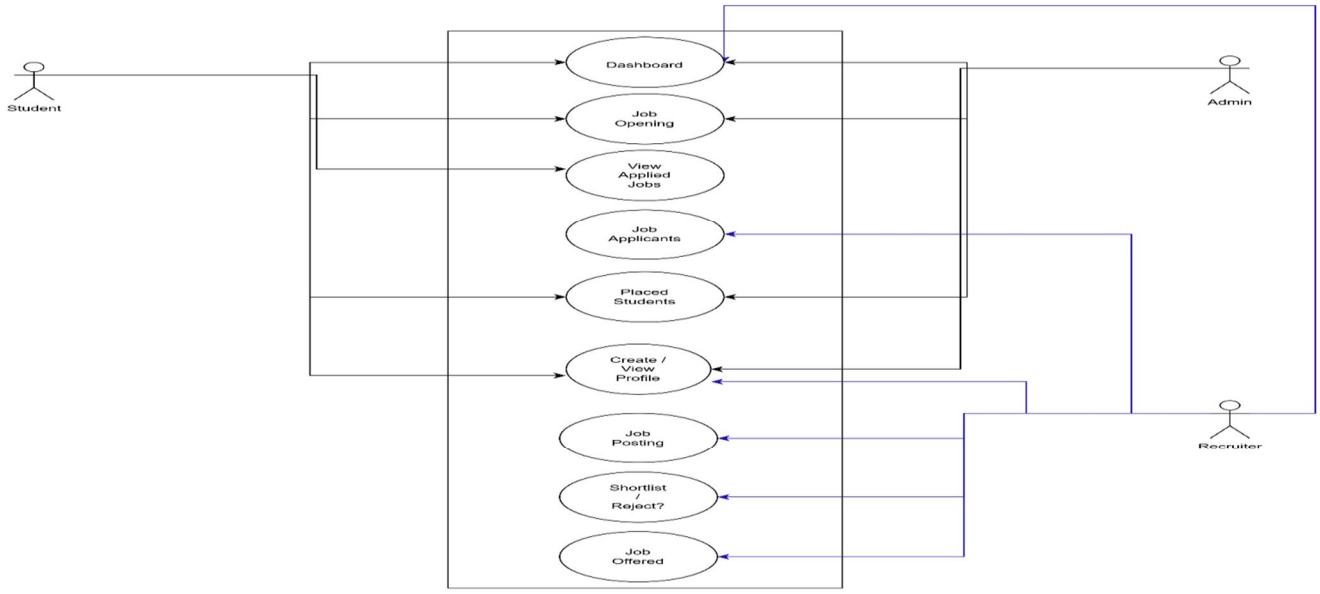
2) Recruiter Module:

- *Register: Recruiter signs up on the platform.*
- *Create Recruiter Profile: Completes the profile with company details.*
- *Post Job Opening: Publishes job openings along with criteria.*
- *View Student Profiles: Reviews student resumes that match job requirements.*
- *Select or Reject Candidates: Takes decisions on applications based on suitability.*

3) Student Module:

- *Register: Student registers on the platform.*
- *Create Student Profile: Fills in personal, academic, and project details.*
- *Upload Resumes: Adds a PDF resume to the system.*
- *View & Apply for Job: Browses jobs and applies to relevant ones.*
- *Calculate Placement Score: The system evaluates student data (skills, academics, project experience) and generates a placement score using ML algorithms like Random Forest.*
- *Recommend Skill Improvement if Score is Low: If the score is below a threshold, the system uses NLP to analyse the resume and suggests which **skills to learn or improve**, helping the student become job-ready.*

4) Use Case Diagram for Role-Based Campus Placement Management System:



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V. RESULTS & DISCUSSION

The PlaceMe platform effectively uses NLP and Random Forest to predict student placement chances based on resume data. The model shows good accuracy and adapts well when admins update skills, keeping predictions relevant to current job market demands. Students with lower scores receive useful skill recommendations to improve their chances. Automating application tracking and notifications also reduces administrative work and improves communication. Some challenges like resume parsing accuracy remain, but overall, PlaceMe offers a flexible and efficient recruitment solution.

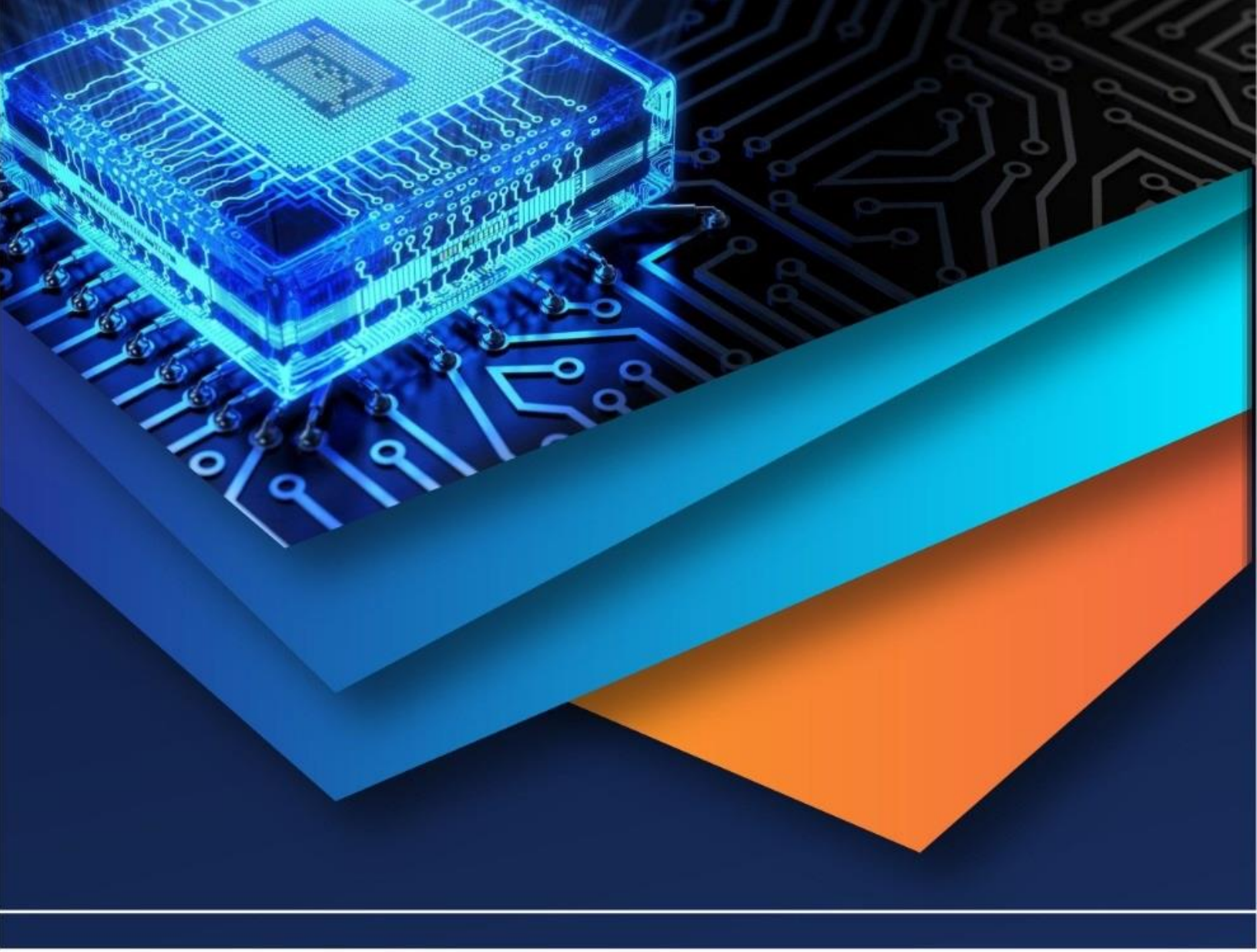
VI. CONCLUSION

PlaceMe is a smart campus recruitment platform that uses machine learning and natural language processing (NLP) to make the placement process more effective and student-friendly. The system reads student resumes and extracts important details like skills, academic background, and project experience using NLP. Then, it uses a Random Forest model to analyze this data and predict how likely a student is to get placed based on the current job requirements.

If a student's chances are low, the system doesn't stop there — it goes one step further and suggests what skills the student should learn or improve to become a better match for the job roles available. This way, students receive personalized feedback that helps them grow. Admins can also update the required skills for each job role and retrain the model with just a file upload, keeping the system up-to-date with the latest industry trends. Overall, PlaceMe makes recruitment smoother, smarter, and more helpful for both students and institutions.

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