CODE BATTLE 2K24

AI DRIVEN RECRUITMENT SYSTEM

TEAM :- TECH TITANS

TEAM NO : B3

TEAM MEMBERS:

1. **VINAYAK NAGANUR**
2. **SUPREETH B H**
3. **VAISHNAVI BHAT**
4. **AKASH DHOTRE**

COLLEGE : JAIN COLLEGE OF ENGINEERING , BELAGAVI.

INTRODUCTION

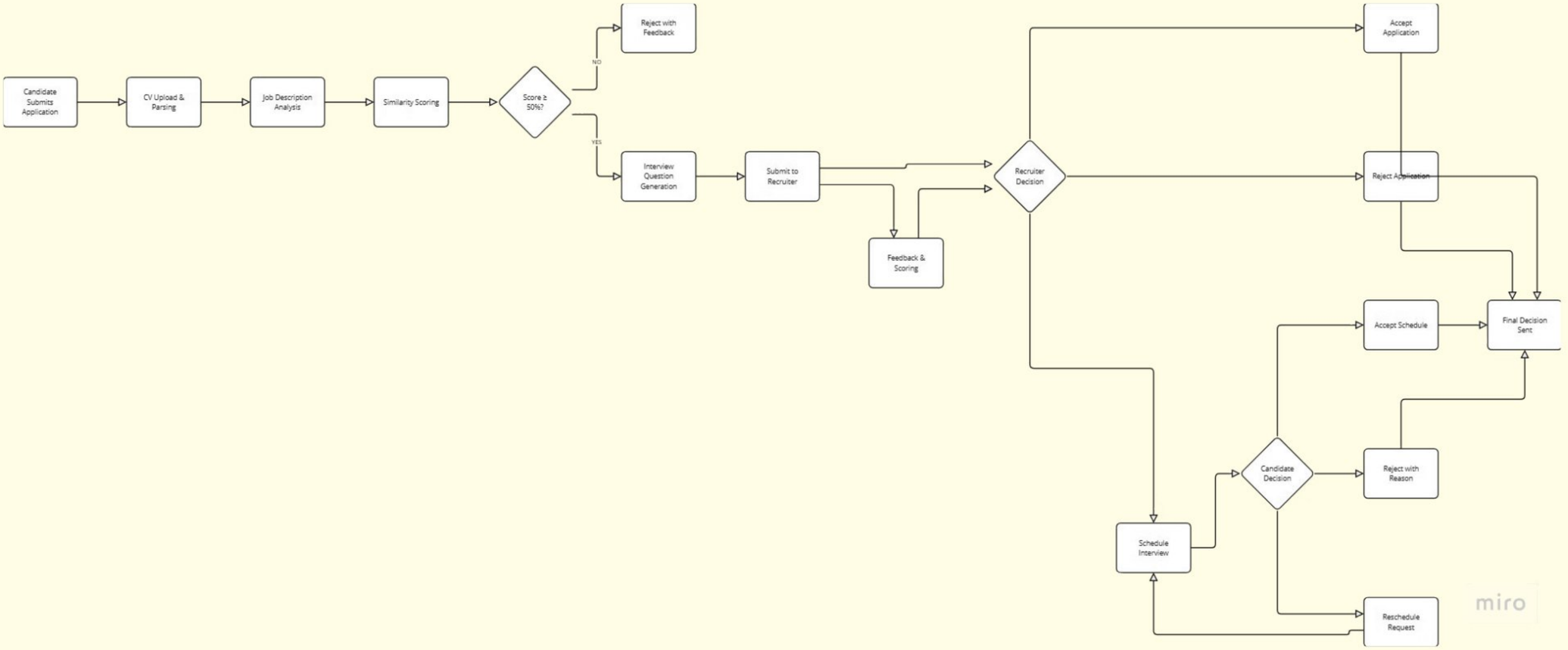
Problem Statement : “AI-Driven Recruitment System”

Description: Modern hiring processes often face challenges due to disconnected systems and manual tasks that slow down recruitment and decision-making. To address this, create an AI powered recruitment platform that streamlines the entire hiring process. The platform will match candidates to job requirements, rank them based on skills and experience, identify skill gaps, and suggest relevant training. By reducing bias and offering data-driven insights, the system ensures fairer, faster, and more efficient hiring decisions, ultimately improving productivity and helping organizations find the best talent.

Key Modules & Features:

1. User Registration & Job Posting • Candidates can sign up & upload resumes. • Companies can post job listings. • Stores user details in a simple database.
2. Resume Upload & Parsing • Extracts basic details (Name, Skills, Experience, Education). • Saves structured resume data for job matching.
3. Job Matching & Candidate Shortlisting • Compares skills with job descriptions. • Ranks candidates based on relevance. • Displays top-matched candidates for recruiters.
4. Candidate Ranking & Scorecard • Assigns a score (0-100%) for job fit. • Uses keyword matching & similarity scoring algorithms. • Shows a scorecard highlighting strengths & weaknesses.
5. Interview & Notification System • Recruiters can send interview invites to shortlisted candidates. • Sends email/SMS notifications for job updates. • Tracks status updates (e.g., "Shortlisted", "Under Review").
6. Fair Hiring & Bias Reduction • Ensures hiring decisions ignore gender, age, and background. • Uses AI fairness checks to avoid biased ranking. • Displays diversity insights to recruiters.

Flowchart



Limitations of Prior Recruitment Systems

Manual CV Screening:

- **Time-Consuming:** HR teams manually sift through hundreds of resumes, leading to delays.

Basic Job-Candidate Matching:

- **Limited Matching Accuracy:** Traditional systems rely on keyword matching rather than understanding the context of skills and experiences.

Static Interview Questioning:

- **Generic Questions:** Most systems use pre-set, static questions that don't align with each candidate's unique experience.

Limited Feedback Mechanisms:

- **Minimal Feedback:** Candidates often receive vague rejection emails with no constructive feedback.

Rigid Scheduling Processes:

- **Fixed Scheduling:** Candidates and recruiters struggle to coordinate interview timings, causing delays.

Delayed Notifications:

- **Slow Communication:** Updates on candidate decisions or next steps may take days, reducing responsiveness.

Bias in Hiring:

- **Unintentional Bias:** Demographic details can subconsciously influence hiring decisions (e.g., gender, age, ethnicity).

Limited Data Insights:

- **No Candidate Rankings:** Recruiters manually rank candidates, which can be subjective and inconsistent.

Proposed System: AI-Driven Recruitment System

Objective:

To revolutionize the recruitment process by leveraging artificial intelligence for automating CV screening, generating personalized interview questions, and optimizing candidate evaluation.

Key Features:

- **Automated CV Parsing:** Extract skills, experience, and qualifications using Natural Language Processing (NLP).
- **Job-Candidate Matching:** Use similarity scoring (e.g., cosine similarity) to match candidates with job descriptions (threshold: 50%).
- **Dynamic Interview Question Generation:** Generate tailored interview questions based on candidate resumes and job requirements.
- **Intelligent Feedback & Scoring:** Analyze candidate responses and provide constructive feedback with performance scores.
- **Candidate Decision Portal:** Enable candidates to accept, reject, or reschedule interviews with reasons and date-time selections.
- **Real-Time Notifications:** Instant updates to recruiters on candidate decisions, interview feedback, and final scores.
- **Dashboard analytics:** filters top candidates based on scores, top responses , age category**.**
- **Instant interview scheduling**: instant updates to candidates about offline interview schedule

Technology Stack for AI-Driven Recruitment System

1. **Backend Development Flask (Python)**: Lightweight and flexible web framework to build REST APIs and handle server-side logic
2. **Frontend Development HTML, CSS, JavaScript**: For building a responsive and user-friendly interface.
3. **Natural Language Processing (Python)**: Converting text (resumes, job descriptions) into vector embeddings. spaCy / NLTK: Extracting skills, experience, and entities from CVs using Named Entity Recognition (NER).
4. **Large Language Models (LLMs) Google Gemini API / Hugging face:** Generating personalized interview questions and analyzing candidate responses.
5. **Database & Storage MongoDB**: NoSQL database for storing structured data (e.g., parsed resumes, feedback). SQL (SQLite/PostgreSQL): Managing relational data for job listings, users, and applications.
6. **Similarity Scoring & Matching Cosine Similarity (Python)**: Measuring the similarity between resumes and job descriptions.
7. **API & HTTP Requests Requests (Python Library):** Handling API requests for model inference and external services. REST APIs: Enabling communication between frontend, backend, and third-party APIs.
8. **Deployment & Infrastructure Gunicorn :** Running Flask applications in production environments.

Future Scope of AI-Driven Recruitment System

1. Advanced Skill Gap Analysis

- Use machine learning to identify specific skill gaps in candidates and recommend personalized learning resources or training modules.

2.Multilingual Support

- Expand the system to parse and match resumes and job descriptions in multiple languages, broadening global hiring capabilities.

3.Voice & Video-Based Assessments

- Integrate real-time voice and video analysis to assess candidate communication skills, sentiment, and body language during live interviews.

4.Predictive Analytics for Candidate Success

- Use historical data and behavioral patterns to predict long-term candidate performance, retention probability, and cultural fit.

5. Blockchain for Credential Verification

- Ensure the authenticity of candidate qualifications and certifications through blockchain-based verification systems.

6. Gamified Assessments

- Add interactive coding challenges, problem-solving games, and scenario-based assessments to make the evaluation process more engaging.

7. Enhanced Recruiter Insights

- Use AI to generate visual reports on hiring trends, diversity metrics, and market salary benchmarks for data-driven decision-making.

8. Intelligent Interview Scheduling

- Develop a smart scheduling assistant that syncs with calendars, optimizes interview slots, and sends automated reminders to both candidates and recruiters.

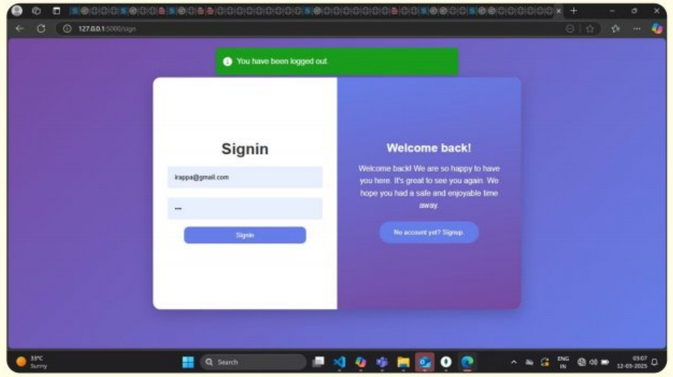
9. AI Chatbot for Candidate Support

- Provide real-time assistance to candidates, answering queries, guiding them through the application process, and offering feedback on their profiles.

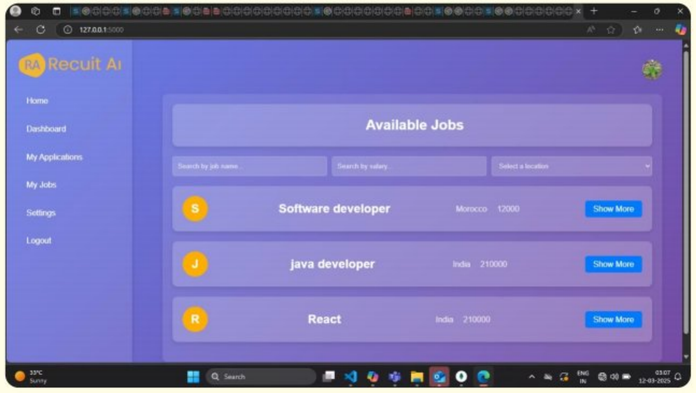
RESEARCH

- IEEE papers : Resspar: AI-Driven Resume Parsing and Recruitment System using NLP and Generative AI
- youtube for demo projects
- chatgpt
- gemini ai

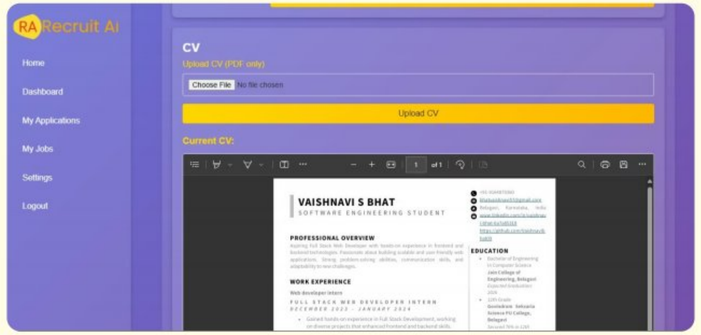
interface view



sign in and sign up page

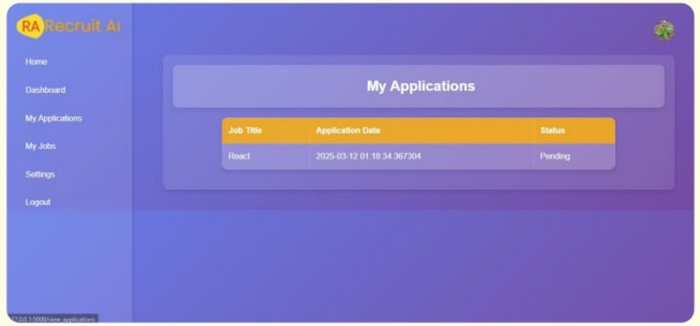


available jobs (home) page

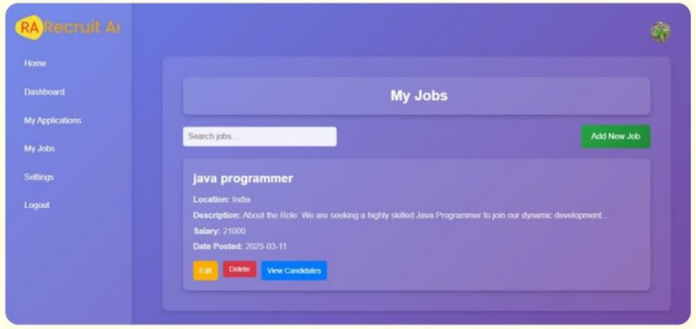


settings(upload CV)

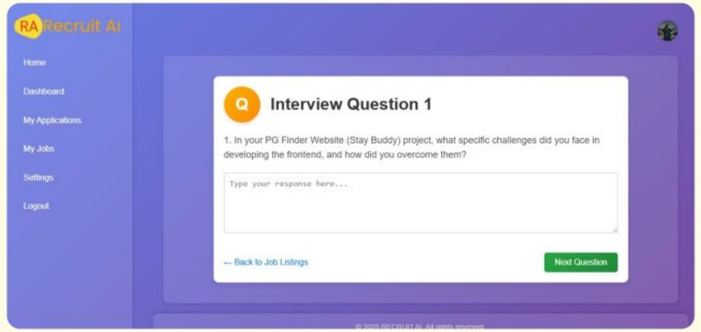
interface view



my applications (status of applied job)

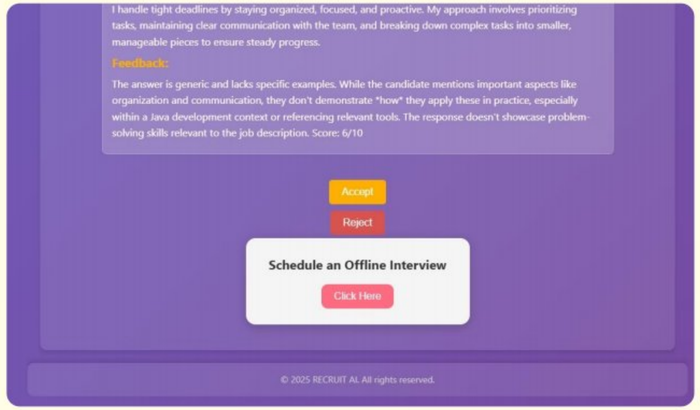


my jobs page for (recruiters)

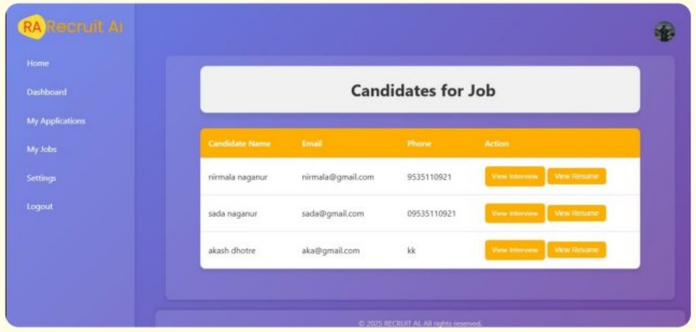


interview questions (if candidates resume matches with job description)

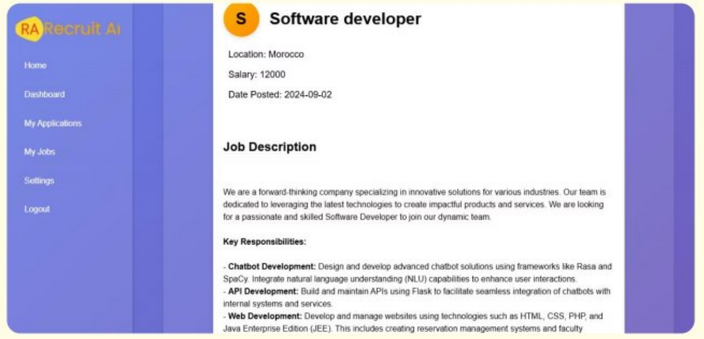
interface view



scheduling interview and accept/reject page of candidates who have attended interview



recruiter can see qualified candidates for their job with their resumes



job description interface

Conclusion

The AI-Driven Recruitment System transforms the hiring process by automating tasks, enhancing candidate evaluation, and providing data-driven insights. By leveraging NLP, machine learning, and real-time decision-making, the system reduces bias, speeds up hiring, and ensures better job-candidate matches.

This innovative approach not only streamlines recruitment but also empowers recruiters and candidates with a seamless, efficient, and fair hiring experience. As technology evolves, the system can continue to adapt and grow, shaping the future of talent acquisition.

With AI at the heart of recruitment, organizations can unlock their full potential and build stronger, more diverse teams!