AI-Powered Skill Mentor for Job Seekers

Software Description & Software Requirements Specification (SRS)

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1. Project Overview

The **AI-Powered Skill Mentor for Job Seekers** is an innovative web-based platform designed to revolutionize career preparation and recruitment.

By leveraging **Artificial Intelligence (AI)** and **Natural Language Processing (NLP)**, the system analyzes resumes, identifies skill gaps, and provides **personalized learning recommendations** to empower job seekers to meet market demands.

For recruiters, it streamlines the hiring process through **AI-ranked candidate matching** based on skill compatibility.

With an intuitive dashboard, secure data handling, and an ethical AI foundation, the platform bridges the gap between education and employability—enhancing career success for both students and professionals.

2. Problem Statement

In the modern job market, job seekers struggle to understand the exact skills employers prioritize.

Traditional platforms depend on **keyword matching**, ignoring deeper skill relevance, growth potential, and job readiness.

This leads to mismatched opportunities, skill gaps, and extended recruitment cycles.

The **AI-Powered Skill Mentor** solves this by:

- Automating resume analysis using NLP,
- Comparing user skills with real-time job market trends,
- Recommending **tailored learning paths** to boost employability.

3. Objectives

1. Extract and analyze skills, education, and experience from resumes using NLP.

2. Compare user skills against real-time job market data to detect gaps.
3. Recommend personalized online courses and certifications to fill those gaps.
4. Display a **Job Readiness Score** and track learning progress via dashboards.
5. Enable recruiters to post jobs and access **AI-ranked candidates**.
6. Support admins in managing users, job data, and AI models.
7. Ensure ethical AI practices through transparency and data privacy.

4. Scope

Users:

- **Job Seekers / Students** → Upload CVs, receive analysis, and learning recommendations.
- **Recruiters / Employers** → Post jobs and view AI-suggested candidates ranked by skill match.
- **Administrators** → Manage users, job postings, and datasets.

Future Extensions:

- Multi-language support.
- Integration with **LinkedIn**, **Coursera**, or similar learning/job APIs.

5. Core Features

Feature	Description
AI-Driven CV Analysis	NLP-based extraction of skills, experience, and education.
Real-Time Skill Gap Detection	Aligns user skills with up-to-date job market demands.
Personalized Learning Recommendations	Suggests courses/certifications (Coursera, Udemy, etc.).
Interactive Dashboard	Displays readiness score, roadmap, and gamified learning progress.
Recruiter Portal	Allows job posting, management, and AI-based candidate ranking.

Secure Authentication	Role-based access (Admin, Employer, Student) with encrypted login.
Ethical AI	Bias detection and explainable AI recommendations.

6. Expected Outcomes

Stakeholder	Expected Benefit
Job Seekers	Improve job readiness by **25%** within 3–6 months through targeted upskilling.
Recruiters	Reduce recruitment time by **30%** using AI-driven candidate matching.
Platform	Establish a scalable, intelligent career mentoring system.
Society	Bridge the education–employment gap and enhance workforce adaptability.

7. System Environment

Component	Technology
Frontend	Vue.js — Responsive web interface
Backend	Node.js (Express.js) — RESTful API
Database	MongoDB — Flexible data handling
AI/NLP Engine	SpaCy, Hugging Face Transformers
Recommender System	Content-based filtering
Deployment	AWS / Render
Design	Figma
Version Control	GitHub

8. Software Requirements Specification (SRS)

8.1 Functional Requirements

FR1 — User Registration & Profile Management (High Priority)

Allow users (job seekers, recruiters, admins) to register, log in, and manage profiles with secure authentication and password reset.

FR2 — Resume Upload (High Priority)

Job seekers upload PDF/DOCX resumes (≤ 5 MB). Validate file size/format before analysis.

FR3 — Resume Analysis & Skill Extraction (High Priority)

Analyze uploaded resumes via NLP (SpaCy, Transformers) to extract skills, education, and experience with **≥ 90% accuracy**.

Fallback: manual skill entry if parsing fails.

FR4 — Job Readiness Score (High Priority)

Compute a **0–100 score** based on:

- 50% skill alignment
- 30% experience
- 20% education

Score updates dynamically as the user completes learning milestones.

FR5 — Skill Gap Detection (High Priority)

Compare user profiles against **real-time job market datasets** (LinkedIn, Kaggle). Update data weekly.

FR6 — Course Recommendations (High Priority)

Recommend online courses/certifications based on detected skill gaps. Cache results for 24 hours to handle API outages.

FR7 — Interactive Dashboard (Medium Priority)

Provide an interactive dashboard showing skill progress, learning roadmap, and readiness score with gamification.

FR8 — Job Posting Management (High Priority)

Allow recruiters to create, edit, or delete job listings with validation for completeness.

FR9 — Candidate Matching (High Priority)

Use hybrid matching (cosine similarity ≥ 0.8 + rule-based filters) to rank candidates by relevance.

FR10 — Recruiter–Candidate Interaction (High Priority)

Enable recruiters to contact candidates through system messaging or email.

FR11 — Admin Management (Medium Priority)

Admins manage users, jobs, and datasets via an admin dashboard.

FR12 — AI Model Maintenance (Medium Priority)

Admins perform quarterly model updates and audits for accuracy and fairness.

FR13 — Explainable AI Outputs (Medium Priority)

Display clear reasoning for AI recommendations (e.g., skill similarity, relevance score).

8.2 Non-Functional Requirements

Category	Requirement
Performance	Process resumes and generate results within 10 s (95% of cases).
Scalability	Support 1,000 concurrent users; scalable up to 10,000 using AWS load balancing.

Security	Encrypt data (SSL/TLS + AES-256); implement role-based access control (RBAC).
Usability	Follow WCAG 2.1 AA accessibility; achieve SUS ≥ 80.
Availability	99.9% uptime with cloud-based redundancy and monitoring.
Maintainability	Modular design; model updates must not affect core logic; documentation maintained.
Compatibility	Fully functional on Chrome, Edge, Firefox, Safari; mobile-responsive.
Data Privacy	GDPR-like compliance, user consent, account deletion, and audit logging.
Ethical AI	Quarterly bias audits ensuring fairness across gender, ethnicity, and background.

8.3 Interface Requirements

Interface	Description
Web Interface	Vue.js dashboard for all user roles; includes gamified visuals and progress tracking.
API Interface	RESTful APIs (Node.js/Express) for resume upload, skill extraction, recommendations, and matching with rate-limiting and JWT auth.
Database Interface	MongoDB collections for user profiles, resumes, jobs, and recommendations; indexed for fast queries.
External Data Sources	Integrations with Coursera, Udemy, LinkedIn, and Kaggle datasets (cached 24 h, refreshed weekly).

9. System Environment Description

Layer	Description
Frontend Layer	Handles user interaction and dashboard visualization.
Backend Layer	Provides APIs, authentication, and NLP endpoints.
AI/NLP Layer	Performs resume parsing, skill extraction, and recommendation generation.
Database Layer	Stores all system and user data.
Deployment Layer	Cloud-hosted with continuous integration and scalability support.

10. References & Tools

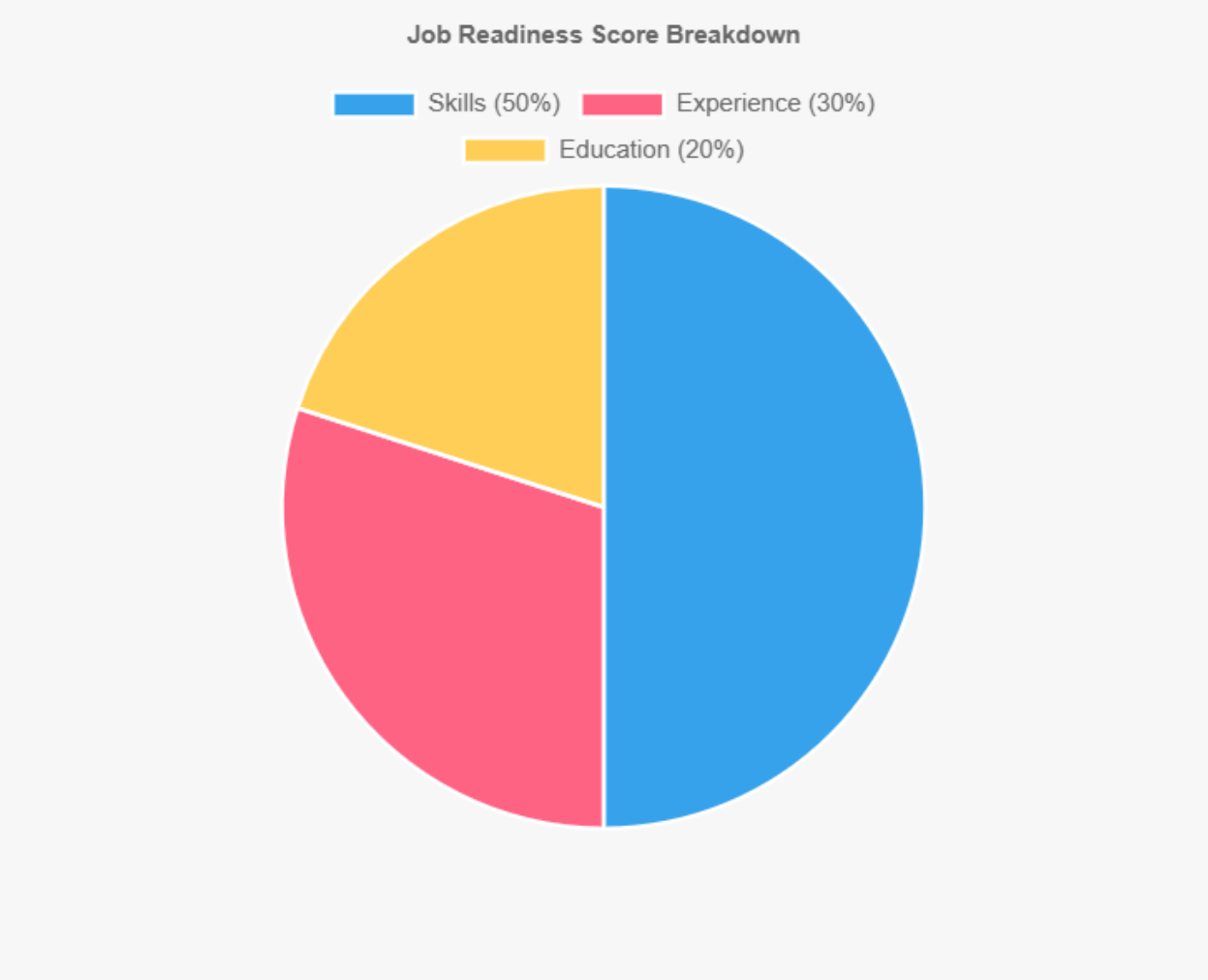
- SpaCy Documentation – https://spacy.io
- Hugging Face Transformers – https://huggingface.co/docs/transformers
- Coursera API – https://api.coursera.org
- Udemy Developer Docs – https://www.udemy.com/developers/affiliate/
- MongoDB Atlas – https://www.mongodb.com/atlas
- Vue.js – https://vuejs.org
- Express.js – https://expressjs.com
- Figma – https://www.figma.com
- IEEE Std 830-1998 — *Recommended Practice for Software Requirements Specification*

11. Keywords

AI, NLP, Job Recommendation, Career Guidance, Skill Gap Analysis,

Recommender Systems, Machine Learning, Career Upskilling,

Talent Acquisition, Vue.js, Node.js, MongoDB.


Job Readiness Score Breakdown
Skills (50%)
Experience (30%)
Education (20%)