Graduation Project Proposal Report

Project Title: AI-Powered Skill Mentor for Job Seekers (Web + NLP + Recommender Systems)

1. Abstract

This project aims to develop an intelligent web-based platform that functions as a personal career mentor for students and job seekers. The system uses Artificial Intelligence (AI) and Natural Language Processing (NLP) to analyze uploaded CVs, extract relevant skills and experiences, and compare them with current job market trends. Based on this analysis, it identifies skill gaps and provides personalized learning paths, recommending relevant online courses, tutorials, and certifications. Additionally, a recruiter portal allows employers to post job openings and receive AI-based candidate recommendations. The platform offers each user a Job Readiness Score, helping them track progress toward employability and professional growth.

2. Problem Statement

Many students and early-career professionals struggle to understand what skills are currently in demand and how well their profiles align with the job market. Traditional career counseling is limited, time-consuming, and often lacks personalization. Likewise, recruiters face challenges in identifying suitable candidates efficiently. Therefore, there is a need for an AI-driven system that automatically analyzes user profiles, detects missing or weak skills, recommends targeted learning resources, and matches job seekers and recruiters intelligently.

3. Objectives

The main objectives of this project are: 1. To design a web platform where users can upload their resumes/CVs. 2. To use NLP techniques for automatic skill extraction and profile analysis. 3. To integrate AI-based job market comparison for identifying skill gaps. 4. To implement a recommender system that suggests personalized learning paths. 5. To create a dashboard that displays a “Job Readiness Score” and career roadmap. 6. To build a recruiter portal for employers to search and match candidates.

4. Methodology

Phase 1: Data Collection
- Collect sample CVs/resumes (anonymized).
- Gather job market data from job boards or a prepared dataset.
- Compile a course dataset (Coursera, Udemy, edX) with course titles and skill tags.

Phase 2: NLP-Based Resume Analysis
- Use NLP libraries such as spaCy, NLTK, or transformer models (BERT/XLM-R) to extract skills, experience, education, and achievements.

Phase 3: Skill Gap Detection
- Compare extracted skills with required skills for target roles.
- Highlight missing or underrepresented skills.

Phase 4: Learning Path Recommendation
- Use a content-based or hybrid recommender system to suggest courses or certifications.

Phase 5: Job Readiness Scoring
- Develop a scoring algorithm that considers skill completeness, experience relevance, and learning progress.

Phase 6: Web Platform Development
- Build the platform's frontend, backend, and database integration.

Phase 7: Recruiter Portal
- Recruiters can register, post jobs, and view AI-ranked candidates using semantic matching.

5. Expected Outcomes

- A functional web-based AI platform that analyzes CVs automatically. - Accurate skill extraction and job-market comparison. - Personalized learning recommendations to close skill gaps. - Dashboard visualization for Job Readiness Score. - A recruiter interface with AI-driven candidate matching.

6. Evaluation Metrics

- Skill Extraction Accuracy → Precision/Recall of extracted skills. - Recommendation Relevance → Based on user feedback or similarity scores. - Job Readiness Score Validity → Expert evaluation vs. system output. - System Usability → User satisfaction surveys from students and recruiters.

7. Expected Impact

This project directly benefits students, graduates, and job seekers by helping them identify and bridge their skill gaps efficiently. It also benefits recruiters by simplifying candidate selection. The system promotes data-driven career guidance, improving job readiness and employability in a rapidly changing job market.

8. Conclusion

The AI-Powered Skill Mentor project merges web development, NLP, and recommender systems to deliver an intelligent, practical, and socially impactful solution. By guiding users through skill enhancement and career planning, it aligns academic learning with real-world job market demands — an innovative step toward smarter employability solutions.