AI Career Guidance & Job Assistant – Final Project Documentation

# 1. Abstract

This project is an AI-powered career assistant that helps students and job seekers in planning their future.  
It builds resumes, finds suitable jobs in real time, prepares for interviews, checks skill gaps, and suggests career paths.  
If a person is weak in a subject or skill, the system tells them how to improve. If they are strong in a skill, it lists companies where they can apply.  
Additionally, it supports video interview analysis (voice + facial expression) and an AI career counseling chatbot for personalized guidance.

# 2. Objectives

- Provide end-to-end career guidance for students and job seekers.  
- Auto-generate professional resumes.  
- Match users with real-time jobs from multiple job portals.  
- Conduct both text-based and video-based mock interviews.  
- Analyze skill strengths and weaknesses.  
- Suggest learning resources and companies.  
- Offer an AI chatbot counselor for one-to-one career help.

# 3. Existing Systems (Literature Survey)

- LinkedIn Jobs → Provides job listings but lacks detailed AI-based guidance.  
- Naukri/Indeed → Job boards without personalized analysis.  
- ChatGPT career advice → Gives suggestions but not fully integrated with jobs + resume + interview.  
  
 Our system is unique because it integrates:  
- Real-time job APIs.  
- Skill gap → improvement + company mapping.  
- Resume building.  
- Text + video interview prep.  
- AI-based career counseling chatbot.

# 4. System Architecture

Main Modules (Agents):  
1. Resume Builder Agent – Auto-creates resumes from user details.  
2. Job Matching Agent – Uses multiple APIs (LinkedIn API, Indeed API, Glassdoor API) to show real-time job postings.  
3. Interview Preparation Bot – Text-based mock interviews + Video analysis of facial expressions, tone, and confidence.  
4. Skill Gap Analyzer – Weak skills → suggest courses; Strong skills → list companies hiring.  
5. Career Path Recommender – Suggests certifications, higher studies, trending domains.  
6. AI Career Counseling Chatbot – One-to-one chatbot for students, career doubts, job confusion, higher study options.

# 5. Prototype (Tech Stack)

- Frontend → React.js (student dashboard)  
- Backend → FastAPI (Python)  
- AI Engine → OpenAI API + LangChain (multi-agent workflow)  
- Database → MongoDB (store user profiles, resumes, job history)  
- Job Fetching APIs → LinkedIn API, Indeed API, Glassdoor API  
- Video Analysis → OpenCV + DeepFace (facial emotion detection) + Speech-to-Text (Google Speech API)  
- Chatbot → Rasa / LangChain chatbot for personalized counseling

# 6. Flow of Work

1. User registers → fills profile + skills.  
2. Resume Builder Agent → creates a professional resume PDF.  
3. Job Matching Agent → fetches live jobs from APIs.  
4. Interview Preparation → Text mode (Mock Q&A) + Video mode (voice confidence + facial expressions analysis).  
5. Skill Gap Analyzer → Weak → suggests courses; Strong → lists companies hiring.  
6. Career Path Recommender → guides higher studies, certifications.  
7. AI Career Counseling Chatbot → personalized career queries anytime.

# 7. Results

Example for a CSE student profile:  
- Skills: Python (Strong), ML (Strong), Data Structures (Weak).  
  
 System Output:  
- Resume ready in 2 mins.  
- Real-time jobs fetched from LinkedIn + Indeed.  
- Interview Bot asks ML-related questions.  
- Video analysis → “You seem nervous, improve eye contact.”  
- Weak Skill → Data Structures → Course link: Coursera DSA in Python.  
- Strong Skill → ML → Companies hiring: Google, Microsoft, Infosys.  
- Career Chatbot → Suggests MS in AI or certification in TensorFlow.

# 8. Conclusion

This project provides end-to-end career assistance.  
It is not just a job portal but a personal AI mentor that helps students and job seekers improve weak areas, apply their strengths, and prepare for interviews.

# 9. Future Scope

- Add LinkedIn login → auto-fetch user profile.  
- Add voice analysis for stress detection in interviews.  
- Add recommendations for freelancing projects along with jobs.  
- Expand chatbot with multi-language support.

**10 . Prototype Design**

**1. Login / Register Page**

* Fields: Name, Email, Password, Skills.
* Buttons: **Login**, **Register**.
* After login → Dashboard.

**2. Dashboard**

* Greeting: “Welcome, [User] 👋”
* Cards for:
  + Resume Builder
  + Job Finder
  + Interview Prep
  + Skill Gap Analyzer
  + Career Path,Chatbot

**3. Resume Builder**

* Form: Name, Email, Education, Skills, Projects.
* Button: **Generate Resume** → Shows sample PDF download.

**4. Job Finder**

* Input: Role (e.g., “Python Developer”), Location.
* Output: **Job Cards** (Company, Role, Apply Link).
* (Prototype: Fetch mock jobs from JSON file).

**5. Interview Preparation**

* **Text Mode**: AI asks 5 questions → user types answers → shows feedback.
* **Video Mode**: Camera opens → records → shows “Confidence: 70%, Eye Contact: Low.”

**6. Skill Gap Analyzer**

* Input: Skills list (Python, SQL).
* Output:
  + Weak → Suggest courses.
  + Strong → List companies.

**7. Career Chatbot**

* Chat window where user asks career-related questions.
* Example:
  + User: “Which company hires Python developers?”
  + Bot: “Infosys, TCS, and Google are hiring Python developers.”