

Detecting Micro Skills and Unlocking Macro Careers

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ABSTRACT: The “Detecting Micro Skills and Unlocking Macro Careers” system is an AI-driven platform designed to analyse candidate skills and provide career recommendations based on their technical abilities. Traditional recruitment systems rely heavily on keyword-based resume filtering, which often fails to accurately evaluate candidate potential. The proposed system uses Natural Language Processing (NLP) and Machine Learning (ML) techniques to extract skills from resumes, coding platforms, and project data to build a detailed skill profile. The system performs skill-gap analysis and recommends relevant courses, projects, and career paths to improve employability. Additionally, it generates ATS-optimized resumes and provides real-time job recommendations. The platform includes an interactive dashboard that visualizes candidate skills, strengths, weaknesses, and career readiness scores. Overall, the system helps candidates enhance their career opportunities while assisting recruiters in identifying suitable candidates efficiently.

KEYWORDS: Skill Gap Analysis, Resume Parsing, NLP, Machine Learning, Career Recommendation, ATS Optimization, Dashboard Analytics.

I. INTRODUCTION

In today’s competitive job market, identifying the right skills required for a particular career path is a major challenge for students and job seekers. Many candidates possess valuable skills but fail to present them effectively due to limitations in traditional resume screening systems. Most recruitment platforms rely on keyword-based Application Tracking Systems (ATS), which often overlook capable candidates if their resumes do not contain specific keywords. The main objective of the **Detecting Micro Skills and Unlocking Macro Careers** system is to address these challenges by analyzing candidate skills using Artificial Intelligence techniques. The system extracts micro-skills from resumes and coding platforms, analyzes them using NLP and machine learning techniques, and maps them to suitable job roles.

By identifying skill gaps and recommending appropriate learning paths, the system helps candidates improve their employability and align their skills with industry requirements.

II. EXISTING SYSTEM

In today’s competitive job market, identifying the right skills required for a particular career path is a major challenge for students and job seekers. Many candidates possess valuable skills but fail to present them effectively due to limitations in traditional resume screening systems. Most recruitment platforms rely on keyword-based Application Tracking Systems (ATS), which often overlook capable candidates if their resumes do not contain specific keyword. The main objective of the **Detecting Micro Skills and Unlocking Macro Careers** system is to address these challenges by analyzing candidate skills using Artificial Intelligence techniques. The system extracts micro-skills from resumes and coding platforms, analyzes them using NLP and machine learning techniques, and maps them to suitable job roles.

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A. Drawbacks of Existing System

1. Heavy dependence on keyword-based resume filtering.
2. Lack of accurate skill-gap analysis.
3. Limited personalization in career recommendations.
4. No integration with coding platforms like GitHub or LeetCode.
5. Candidates do not receive feedback to improve their employability.

III. PROPOSED SYSTEM

The proposed system is an AI-powered career intelligence platform designed to analyze candidate skills and recommend suitable career opportunities. The system collects candidate data from resumes and coding platforms, processes the data using NLP techniques, and extracts technical and soft skills.

The extracted skills are analyzed to determine the candidate's primary domain, strengths, and missing competencies. Based on this analysis, the system provides personalized career recommendations, generates ATS-friendly resumes, and suggests job opportunities. The system also includes an AI-based mock interview module and a visualization dashboard that helps candidates track their skill progress and readiness for industry roles.

A. Advantages of Proposed System

1. **Accurate Skill Detection:** Uses NLP techniques to extract skills from resumes and coding platforms.
2. **Skill Gap Analysis:** Identifies missing skills required for target job roles.
3. **Career Recommendations:** Suggests courses, projects, and certifications for improvement.
4. **ATS Resume Optimization:** Helps candidates create resumes that pass ATS filters.
5. **Interactive Dashboard:** Provides visual insights into skill strengths and weaknesses.
6. **Job Matching:** Recommends suitable job opportunities based on candidate skills.

IV. METHODOLOGY**A. Data Collection and Preprocessing Module**

This module collects candidate data from resumes, GitHub repositories, and coding platforms. The system extracts raw text from uploaded resumes and cleans the data by removing unnecessary characters, stop words, and formatting errors.

B. Skill Extraction Module

The system uses Natural Language Processing techniques such as Named Entity Recognition (NER) to extract technical skills, tools, and programming languages from the resume content.

C. Skill Classification Module

Extracted skills are categorized into different technical domains such as Web Development, Data Science, Artificial Intelligence, and Cloud Computing.

D. Skill Gap Detection Module

The candidate's skills are compared with predefined job role requirements to identify missing or weak skills.

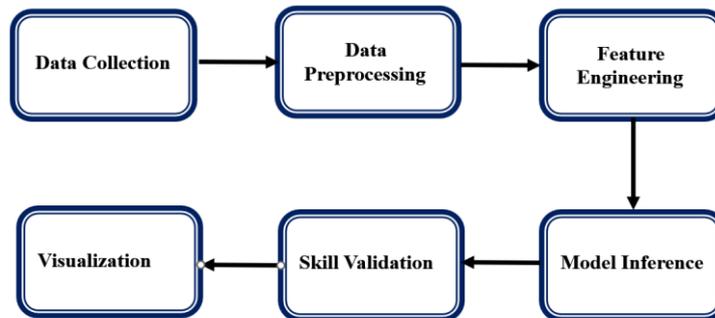
E. Recommendation Module

Based on the skill gap analysis, the system recommends relevant courses, projects, certifications, and job opportunities to help candidates improve their employability.

V. SYSTEM ARCHITECTURE

The system follows a modular architecture consisting of a frontend interface, backend processing modules, machine learning components, and a database. The frontend allows users to upload resumes and interact with the system dashboard. The backend processes resume data, performs skill extraction, and generates career recommendations. Machine learning models analyze the extracted data and generate skill-gap reports, while the database stores candidate profiles and skill information. The architecture ensures efficient data processing and seamless integration between different system components. Fig1. Shows the System Architecture Diagram.

System Architecture Diagram

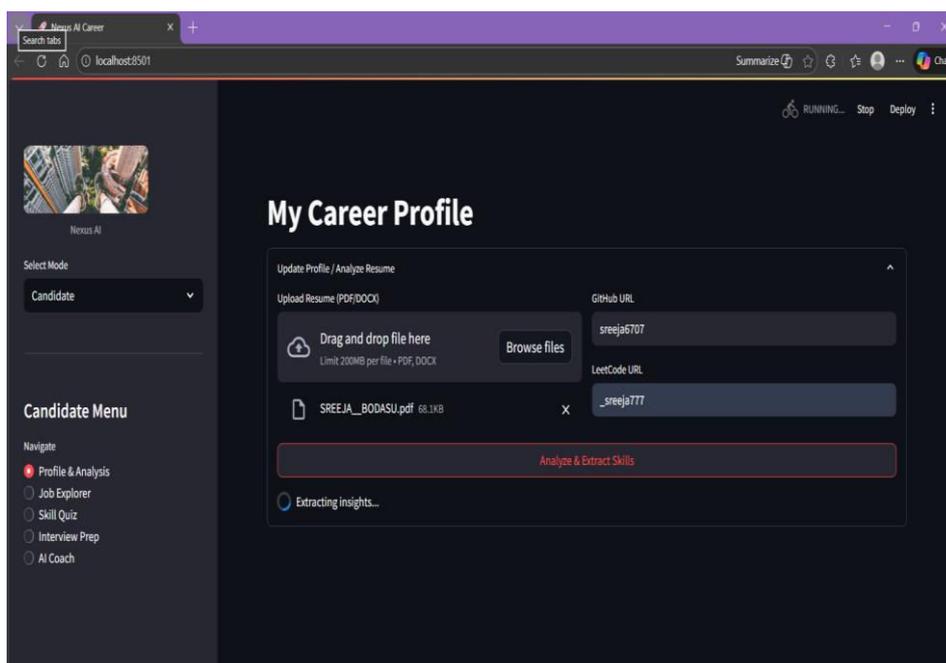


VI. RESULTS AND OUTPUT

[1] Step 1: Resume Upload

The system allows users to upload resumes in PDF or DOCX format. The uploaded resume is processed and converted into structured text data.

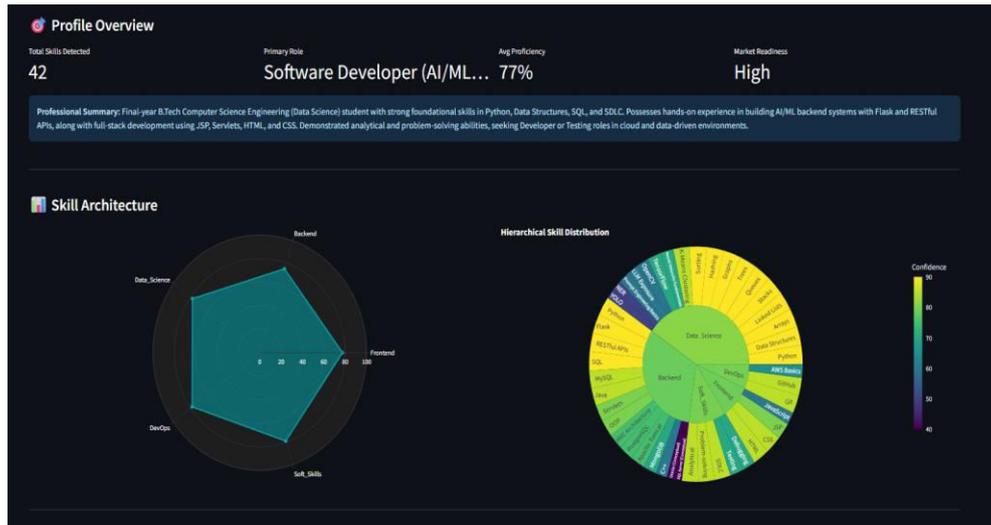
Fig 2. Shows uploading the resume in pdf format.



[2] Step 2: Skill Extraction

The system analyzes the resume content and extracts technical and soft skills using NLP techniques.

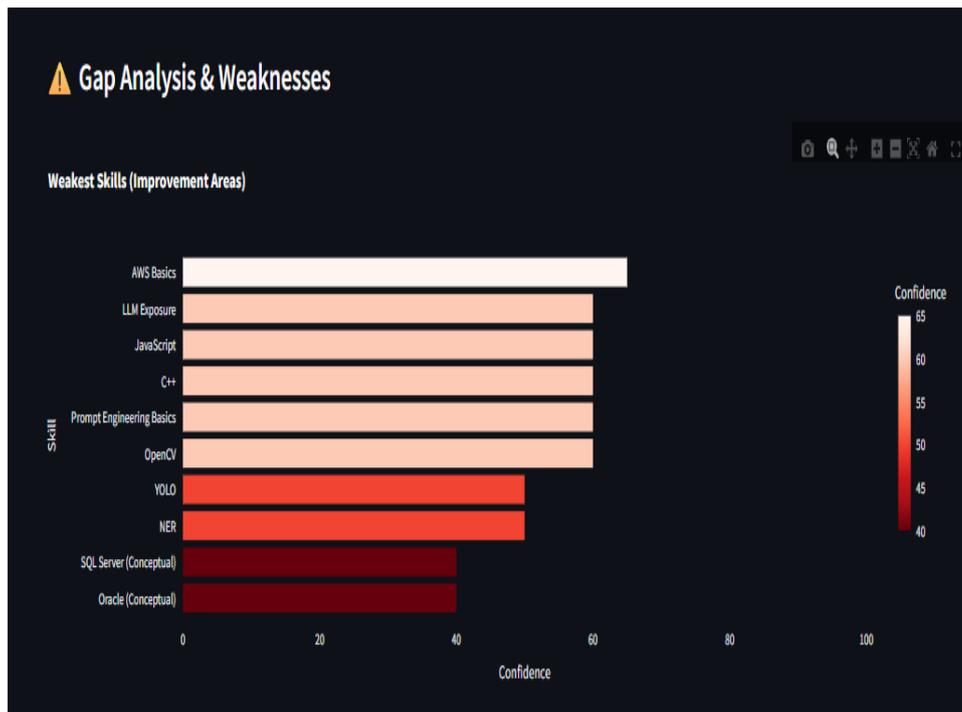
Fig3. Shows Extracting the skills from the resume uploaded and from the links that are uploaded and maintaining a skill architecture chart.



[3] Step 3: Skill Analysis Dashboard

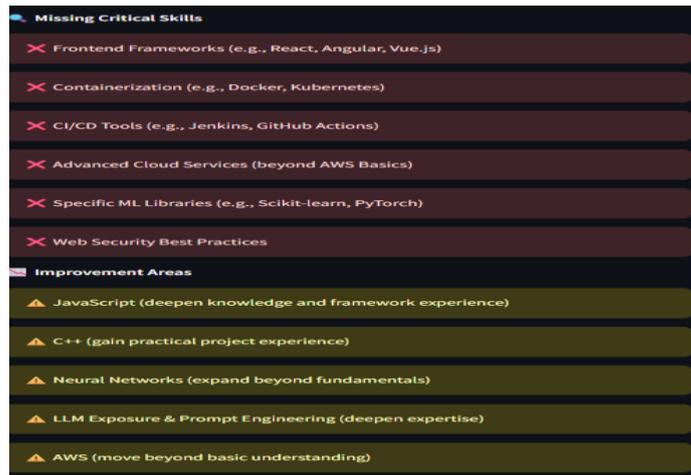
The dashboard displays candidate skills, domain strengths, and proficiency scores through visual charts and graphs.

Fig4. Shows the gap in skills and where to improve.



[4] Step 4: Skill Gap Identification

Fig6. Shows the system compares the candidate’s skills with job role requirements and highlights missing skills.



[5] Step 5: Career Recommendations

Based on the analysis, the system suggests relevant courses, projects, certifications, and job opportunities to improve career prospects.

Fig 7. Shows the Job openings.

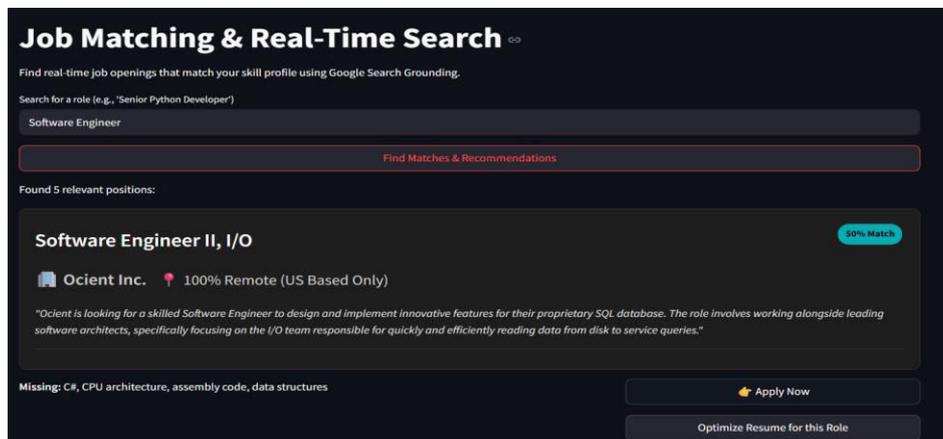
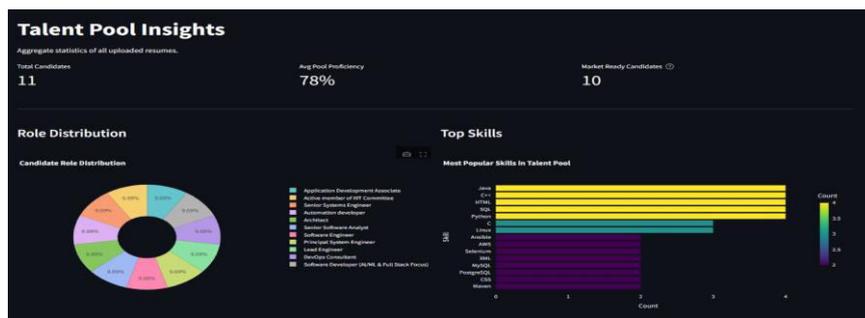


Fig8. Shows the candidates proficiency using visual charts.



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The **Detecting Micro Skills and Unlocking Macro Careers** system provides an intelligent solution for analyzing candidate skills and guiding them toward suitable career opportunities. By integrating NLP and machine learning techniques, the platform accurately identifies skill gaps and provides personalized recommendations.

The system improves employability by helping candidates understand their strengths and weaknesses while enabling recruiters to identify skilled candidates more efficiently.

Future improvements can include integrating advanced deep learning models, adding support for multiple languages, and deploying the system on cloud platforms for scalability and real-time job market integration.

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