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Career Bot: A Speech-Driven, Skill-Based Career Guidance System with Smart Scheduling and ATS-Friendly Resume Generation

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Abstract
Career planning and getting ready for a job are very important for students and people who already have jobs. The old ways of getting career advice are usually done by hand. They take a lot of time. They do not consider the individual and what they want. Many students and people looking for jobs have a time finding careers that are a good fit for them. They want to do something they're good at and something they like to do. They also want to use what they studied in school. Career planning and job preparation are necessary for career development and, for students and people who already work career planning is important. A lot of students and people looking for jobs have a time finding the right career. They want a career that's a good fit for the things they are good, at and the things they like to do. Careers should match their skills and interests. Finding a job and getting ready for a career is really tough these days. Many companies use computers to look at resumes before a person even sees them. So resumes have to be set up in a way and include certain words to get through the computer check. Career planning is a part of career development and job preparation and career planning is very important, for career development and job preparation. Career planning and job preparation go hand in hand. The proposed AI-based Career Guidance and ATS Resume Generation System integrates skill analysis, career recommendation, and resume generation into a single platform. The system assists users in selecting suitable career paths and generates ATS-compliant resumes based on their skills and preferences. This approach aims to enhance employability, reduce career-related confusion, and provide an efficient solution for career planning and job preparation.

Keywords: *Career Guidance System, Artificial Intelligence, ATS Resume Generator, Skill Analysis, Career Recommendation, Learning Plan*

1. Introduction

1.1.Overview

Career planning and getting ready for a job are very important for students and people who already have jobs. The old ways of getting career advice are usually done by career counselor, teacher or mentor. They take a lot of time. They do not consider the individual and what they want. Many students and people looking for jobs have a time finding careers that are a good fit for them. They want to do something they're good at and something they like to do. They also want to use what they studied in school. Career planning and job preparation are necessary for career development and, for students and people who already work career planning is the important. A lot of students and people looking for jobs have a time finding the right career. They want a career that's a good fit for the things they are good, at and the things they like to do. Careers should match their skills and interests Finding a job and getting ready for a career is really tough these days. Many companies use computers to look at resumes before a person even sees them So resumes have to be set up in a way and include certain words to get through the computer check. Career planning is a part of career development and job preparation and career planning is very important, for career development and job preparation. Career planning and job preparation go

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hand in hand. The proposed AI-based Career Guidance and ATS Resume Generation System integrates skill analysis, career recommendation, and resume generation into a single platform. The system assists users in selecting suitable career paths and generates ATS-compliant resumes based on their skills and preferences. This approach aims to enhance employability, reduce career-related confusion, and provide an efficient solution for career planning and job preparation.

1.2.Motivation

In the current educational and employment landscape, students and job seekers are required to make important career decisions At a stage people do not know what to do. Many people do not get the help and information about jobs that are good for them. They need to know what jobs are there that they would be good at and that they would like. If they do not get this help they often pick the job. This leads to them not being happy with their job not using their skills and not getting better at their job. The thing that makes it even harder for people to figure out what to do is that they do not get help from someone who can give them advice about their career. This is what happens when people do not get personalized career counseling it just gets more confusing for them. It is all about career opportunities and career counseling for the learners and the career counseling is very important, for the learners. The motivation behind this project is to develop an intelligent system that addresses both career guidance and resume preparation challenges. By leveraging Artificial Intelligence, the proposed Career Bot provides personalized career recommendations and automatically generates ATS-friendly resumes. This system aims to support users in making informed career decisions and improving their chances of success in the job market.

1.3.Objectives

- To enable natural user interaction through a speech-driven AI interface.
- To identify technical skill gaps by comparing user profiles with industry standards.
- To recommend personalized online courses based on the identified skill deficiencies.
- To create and validate ATS-friendly resumes to improve student employability and shortlisting rates.
- To generate automated learning schedules with progress reminders and tracking.
- To implement noise-robust speech processing for accurate intent recognition in real-world settings.

2. Literature Review

People have tried to figure out how computers can assist us in making career decisions. These computer systems consider what we are good at what we like to do and what we have learned in school and from our experiences. They then recommend jobs that might be a fit, for us and ways we can gain more knowledge. The people who study career choices and computers say that companies are using computers more and more to find the person for a job. This means we need to make sure our resumes are written in a way that computers can understand so career choices and computers are really important when it comes to finding a job and career choices are something we should think about when we're writing our resumes and using computers to help us with career choices. There are tools that can help us with our resumes suggest careers and find ways to learn things. Usually these tools only do one of these things not all of them at the time. Career guidance systems like these are very useful. We have tools that can help with resumes and careers and learning. Recent approaches that use machine learning and natural language processing improve job matching and skill assessment. However most of these tools focus on career recommendations or resume optimization. They do not give us guidance for skill development. Career guidance systems and tools that help with resumes are very useful, for people who want to learn things and find a new career. This highlights the research gap in creating an end-to-end system that not only offers personalized career guidance but also generates ATS-friendly resumes and recommends targeted learning resources to enhance user readiness for evolving job markets.

3. Methodology

3.1.System overview

The Career Bot system is made up of parts that all work together. It has one part that you talk to another part that does all the work and a third part that takes

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care of all the information. The Career Bot system gets information from users like you it looks at your resume what you are good at what you like to do the kind of career you want and how much free time you have When you upload your resume, to the Career Bot system the Career Bot system looks at your resume the Career Bot system finds out what skills you have. The Career Bot system looks at the information it has about you to figure out what skills you do not have. Then it suggests careers that might be good for you. The Career Bot system does this by using a computer program. This program looks at the skills you have. The skills you need for different careers. The system finds out what skills you are missing. It tells you about courses that can help you. It also makes a schedule for you that fits with your time. The Career Bot system also makes a resume for you that's good, for applying to jobs. This resume is made so that it works well with the systems that companies use to look at resumes. The backend ensures secure data storage and smooth communication between all system components.

3.2.System Architecture

The Career Bot system follows a layered architecture comprising a user interface, AI processing modules, and a backend database. It processes resume uploads and user inputs to perform skill extraction, skill gap analysis, career and course recommendation, ATS-compliant resume generation, and personalized timetable creation. Secure data storage enables seamless communication between all system components. Figure 1 shows Architecture of AI Based Career Bot System

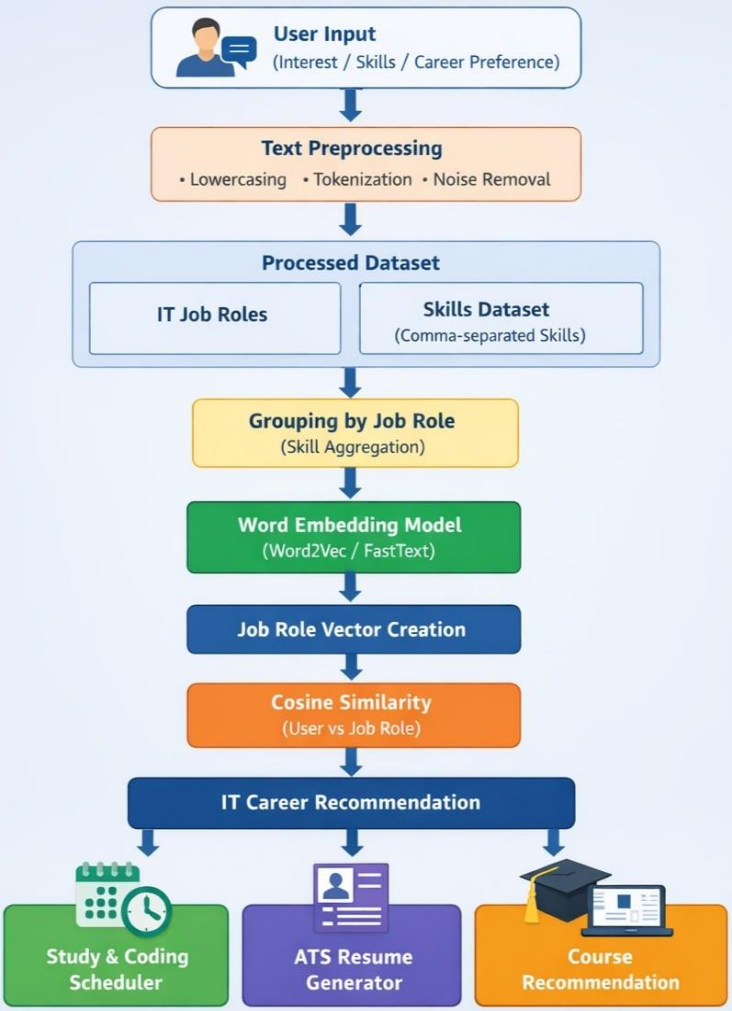

Figure 1 Architecture of AI Based Career Bot System

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3.3.Detailed Workflow

3.3.1. User Input Collection

The process starts when we get information from users. We get this information in ways. For example users can talk to us. We turn what they say into text. They can also type things to us. Upload their resume. When users upload their resume. we read it carefully to find things like what they are good at, where they went to school and what jobs they had before. Users also tell us what kind of job they want, what they like to do what they prefer and how time they have to work on things. We use all this information about the users and their job search to help them. The users give us information about their career goals and the time they can dedicate to a job. All this information is then neatly processed and safely stored in the backend system so it can be used later to provide better analysis and personalized support.

3.3.2. Dataset and Knowledge Base

The system relies on a ready-made dataset that includes information about various careers, the skills needed for each role, and relevant learning courses. This dataset acts as a guide for the system to connect a user's existing skills with appropriate job options and to point out any skills they might be missing. By using this dataset, the system provides clear and uniform recommendations, without assessing the user's expertise level.

3.3.3. Skill Extraction and mapping

Natural Language Processing techniques are applied to extract skills from the user's resume and text inputs. The extracted skills are then mapped against the skills listed in the dataset. Keyword matching and similarity-based techniques are used to identify overlapping and missing skills without estimating or displaying the user's competency level.

3.3.4. Career Recommendation

Based on the mapped skills and user-defined interests, the system recommends suitable job roles by comparing extracted skills with job-role requirements available in the dataset. The recommendation process focuses on skill relevance rather than skill proficiency, ensuring fair and transparent career suggestions.

3.3.5. Skill Gap Identification and Course Recommendation

Skill gaps are identified by detecting missing skills when compared to the required skills of the recommended job roles. Corresponding online courses linked to these skills are recommended to help users acquire the required knowledge. The system provides guidance based on dataset mapping without assessing learning outcomes.

3.3.6. Timetable Generation

The system collects the user's available free time and generates a personalized timetable. The timetable allocates time slots for course learning activities in a structured manner, supporting effective time management without evaluating user performance.

3.3.7. ATS friendly Resume Generation

Finally, the system creates an ATS-friendly resume by neatly arranging the user's skills, work experience, and relevant job-related keywords into a standard resume format. Important keywords from the dataset are added to improve the chances of the resume being noticed during automated screening by Applicant Tracking Systems. All generated resumes and user-related data are safely stored in the backend database for future use.

3.4.Software Specifications

Table 1 Software Requirement

Component	Requirement
Operating System	Windows or Linux
Programming Language	Python version 3.9 or Higher
Web Technologies	HTML, CSS, JavaScript
Libraries and framework	TensorFlow, PyTorch, NLTK, SpaCy
Database	MySQL or PostgreSQL

4. Implementation

4.1.Tools and Technologies Required

The system is built using Python 3.9 to handle everything behind the scenes. This system utilizes machine learning libraries such, as TensorFlow or Py Torch to learn from the data. The Python 3.9 system uses these machine learning libraries to provide the features of the system. The system also uses tools, like NLTK or Spacy to handle language tasks. This means the system has to know how to understand language. The system uses these tools to do this. The tools are important for the system to work properly

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with language tasks. The system uses NLTK or Spacy to make sure it can handle language tasks in the way. The website is made with HTML and CSS and JavaScript. This makes the website easy to use. It also makes the website look really nice. The HTML and CSS and JavaScript work together to make this happen. The system stores data safely using databases, like MySQL or PostgreSQL to manage the data. The system uses these databases to keep the data safe. The system also supports voice interaction through Python-based speech recognition tools.

4.2.Data Collection

The system gathers information from users through multiple inputs, including voice, text, and resume uploads. Spoken inputs are converted into text to keep the data consistent across the system. Uploaded resumes are analyzed to identify key details such as skills, educational background, and professional experience. Users also provide their career goals and available time. All the collected information is securely saved in the backend database for further use.

4.3.Preprocessing

Once the data is collected, the system filters out unwanted and irrelevant information. Text inputs are cleaned and refined so they can be processed smoothly. Resume files are organized into a clear, structured format to make analysis easier. This step prepares the data for accurate skill identification, job-role matching, and further machine learning processes.

4.4.Feature Extraction

Natural Language Processing techniques are applied to extract technical and soft skills from the preprocessed text and resume data. Important keywords and skill-related phrases are identified and mapped against a predefined dataset containing job roles and their required skills. These extracted features serve as the basis for career recommendation, skill gap identification, and course suggestion.

4.5.Machine Learning Model

A machine learning–based recommendation model processes the extracted features and mapped skills to suggest suitable job roles. Skill gaps are identified by comparing user skills with the requirements defined in the dataset. Based on the identified gaps, relevant courses are recommended to support skill development. The model ensures personalized recommendations by aligning user input with the reference dataset.

4.6.Performance and output generation

The system looks at how much free time the user has and builds a study plan that feels easy to follow. It schedules learning sessions for the recommended courses in a simple and organized way. At the same time, it creates an ATS-friendly resume by properly arranging the user's skills, work experience, and important job-related keywords. All the generated details, such as career suggestions, study plans, and resumes, are safely saved in the backend for future use or updates.

5. Result and Discussion

The Career Bot system was tested with kinds of user input such as resumes things people typed and things people said. It did a job of finding the important skills, from these inputs. The Career Bot system matched these skills to a list of jobs the skills needed for those jobs and some courses that can help with the Career Bot system. The Career Bot system used this list to figure out what skills were missing from the user. Then the Career Bot system suggested some courses to fill those gaps with the Career Bot system. The Career Bot system also made schedules that fit around the user time with the help of the Career Bot system. The Career Bot system is really helpful for people who want to get a job. It made resumes that're good enough to get past the computers that screen them which is pretty cool. The Career Bot system helps people make a resume. It tells them what skills they need to learn. The Career Bot system even helps them make a plan to learn those skills, which's great. The Career Bot system is very useful, for people who want to get a job because it does all these things. The Career Bot system is a help. The results indicate that the system can efficiently process multiple input formats and consistently deliver dataset-driven career recommendations. The use of a predefined dataset ensures that job roles and course suggestions are aligned with industry standards. Timetable generation effectively allocated learning slots, and ATS resume generation incorporated relevant keywords to enhance visibility during automated resume screening. Overall, the system demonstrates

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its effectiveness in guiding users toward suitable career paths through structured and data-driven analysis. (Figure 2 & 3)

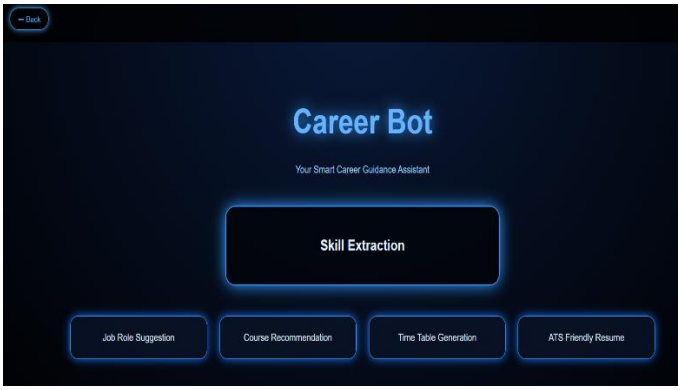

Figure 2 Career Bot Home Interface Showing Core Functional Modules

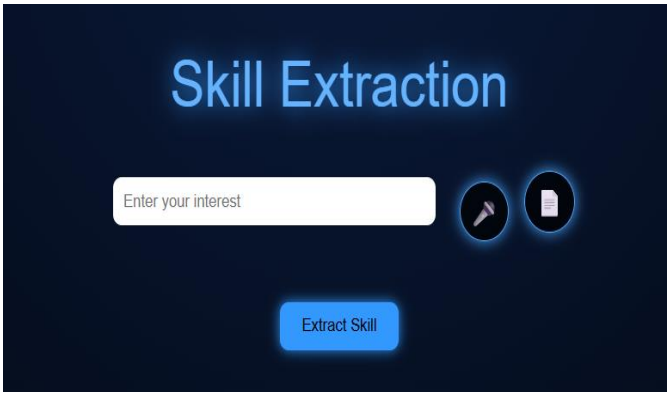

Figure 3 Skill Extraction Module Interface for Extracting User Interests and Skills

Conclusion

This paper is about Career Bot. Career Bot is a system that helps people with their careers. It uses a list of jobs and courses to give people advice on what Career Bot thinks is the career for them. The Career Bot system looks at what people are good at and what they need to work on. Career Bot then suggests classes that can help people get better at the things they're not so good, at. The Career Bot also makes a schedule for people to follow so they can learn what they need to learn from Career Bot. The Career Bot system is really good. It helps people make a resume that's good enough to send to companies. The Career Bot system is very helpful for people who want to do something with their careers. The Career Bot system is great at this. People can use the Career Bot system to get help with their careers. The Career Bot system is good, for people who need to make a resume and send it to companies. By using the dataset as the core knowledge base, Career Bot ensures that job and course recommendations are consistent, accurate, and aligned with industry requirements. The implementation demonstrates efficient handling of multiple input formats, effective skill mapping, and generation of actionable outputs to support career planning. Future work may include expanding the dataset to cover additional job domains, integrating real-time course updates, and connecting with online job portals to provide live career recommendations.

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