**Project name: Smart occupational guidance system**

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1. Project description

The project aims to create a smart career guidance system that will assist job seekers in effectively tailoring their resumes to specific job openings, as well as expanding their awareness of the diverse range of career opportunities available. The system will leverage machine learning and natural language processing techniques to analyze resume data, identify key traits and skills required for different occupations, and provide personalized recommendations to users.

2. Related Work

Existing solutions in the career guidance space typically focus on resume formatting tools or manual telephone-based counseling. There is a lack of integrated systems that can analyze user profiles, match them to suitable roles, and automatically generate optimized resumes. Prior academic research in the areas of resume analysis, job recommendation systems, and natural language processing for career guidance provides the foundation for the proposed solution.

3. Functional Description / Requirements

The key functionalities of the system include:

- Online questionnaire for users to provide detailed personal profiles

- Resume analysis and extraction of key traits required for different occupations

- Personalized recommendations of suitable roles and fields based on user profile

- Automatic generation of optimized resumes for target positions

- Suggestions for relevant training and educational programs to pursue desired careers

4. Architecture

The system will consist of a web-based frontend interface for user interaction, and a backend powered by various machine learning models and data processing mechanisms.

4.1. Each Module Description

- Resume Analysis Model: CNN/RNN-based neural networks to extract personality traits, skills, and experience from resume text data

- Recommendation Engine: Fully connected neural networks to match user profiles to suitable occupations and roles

- Resume Generation Model: Language models like GPT or LSTM to generate personalized resume content

- Career Mapping Database: Repository of occupations linked to relevant educational programs and training

5. Work Plan

The project will be executed over the following milestones:

- Data collection and preprocessing (1 month)

- Development of resume analysis and recommendation models (2 months)

- Implementation of resume generation capabilities (1 month)

- Integration of frontend and backend components (1 month)

- Testing and refinement (1 month)

The work will be divided among the team members based on their expertise in machine learning, natural language processing, and full-stack development.

6. Client Side

6.1. Usage Illustration

Users will be able to access the system through a web-based interface. They can provide their personal details, upload an existing resume, and select their preferred job roles or fields of interest. The system will then analyze the user's profile, generate personalized resume recommendations, and suggest relevant training and educational opportunities.

6.2. Mockup

The user interface will have a clean, modern design with intuitive navigation. Key screens will include the user profile questionnaire, resume upload, job/field selection, and the results page displaying the recommended roles, sample resumes, and learning resources.

7. Server Side

7.1. API

The server-side API will expose endpoints for user profile submission, resume analysis, job recommendations, and resume generation. These will be consumed by the client-side interface to provide a seamless user experience.

8. Algorithm and Data Processing Mechanisms

The project will leverage various machine learning algorithms and data processing techniques, including:

- Resume analysis using CNN/RNN-based neural networks for NLP and information extraction

- Recommendation systems with fully connected neural networks for user-job matching

- Language models like GPT or LSTM for automated resume generation

- Database mapping of occupations to relevant educational programs and training

9. Data Sources

The system will be trained on a large, diverse dataset of resumes collected from sources like Kaggle, job boards, and web scraping. This will enable the models to learn the key characteristics and requirements for a wide range of occupations.

10. References

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