

AI RESUME ANALYZER USING LLM
PROJECT REPORT
21AD1513- INNOVATION PRACTICES LAB

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in partial fulfillment of the requirements for the award of
degree of
BACHELOR OF TECHNOLOGY
in
ARTIFICIAL INTELLIGENCE AND DATA SCIENCE



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October, 2024

BONAFIDE CERTIFICATE

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ABSTRACT

Smart Resume Analyzer is a project designed to enhance the job recruitment process by automating the initial screening of job applications. Utilizing natural language processing (NLP) and machine learning techniques, including the innovative LLaMA (Large Language Model Meta AI) framework, the system analyzes and extracts pertinent information from candidates' resumes. This extracted data is evaluated against job requirements to provide a suitability score for each candidate. Additionally, the system offers personalized feedback, guiding candidates in improving their resumes to increase their chances of employment. By efficiently identifying the best-fit candidates, Smart Resume Analyzer aims to save time for employers and streamline the recruitment process, thereby facilitating better hiring decisions.

Keywords :

1. Smart Resume Analyzer
2. Natural Language Processing
3. Machine Learning
4. LLaMA
5. Resume Screening
6. Job Recruitment
7. Candidate Evaluation
8. Personalization
9. Suitability Score.

ACKNOWLEDGEMENT

I also take this opportunity to thank all the Faculty and Non-Teaching Staff Members of Department of Artificial Intelligence and Data Science for their constant support. Finally I thank each and every one who helped me to complete this project. At the outset we would like to express our gratitude to our beloved respected Chairman, **Dr.Jeppiaar M.A.,Ph.D**, Our beloved correspondent and Secretary **Mr.P.Chinnadurai M.A., M.Phil., Ph.D.**, and our esteemed director for their support.

We would like to express thanks to our Principal, **Dr. K. Mani M.E., Ph.D.**, for having extended his guidance and cooperation.

We would also like to thank our Head of the Department, **Dr.S.Malathi M.E.,Ph.D.**, of Artificial Intelligence and Data Science for her encouragement.

Personally we thank **Dr. E. BHUVANESWARI M.E.,Ph.D**, Department of Artificial Intelligence and Data Science for the persistent motivation and support for this project, who at all times was the mentor of germination of the project from a small idea.

We express our thanks to the project coordinators **DR.S.RENUGA M.E., Ph.D.**, Associate Professor & **Ms.K.CHARULATHA M.E.**, Assistant Professor in Department of Artificial Intelligence and Data Science for their Valuable suggestions from time to time at every stage of our project.

Finally, we would like to take this opportunity to thank our family members, friends, and well-wishers who have helped us for the successful completion of our project.

We also take the opportunity to thank all faculty and non-teaching staff members in our department for their timely guidance in completing our project.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	MEANING
AI	Artificial Intelligence
DL	Deep Learning
CNN	Convolutional Neural Networks
mAP	Mean Average Precision
TPO	Threat Prevention Optimization
LLM	Large Language Model
NLP	Natural Language Processing
TTA	Trusted Third Authority
IoT	Internet of Things
CV	Computer Vision
CCTV	Closed-Circuit Television
ROI	Return on Investment
R&D	Research and Development
DB	Database
API	Application Programming Interface

CHAPTER 1

INTRODUCTION

1.1 Introduction to AI-Powered Resume and Portfolio Analyzer

In an increasingly competitive job market, candidates compete for positions across various industries, leading to a daunting task for employers: screening potentially thousands of resumes. Traditionally, this process relies on human recruiters, making it time-consuming, inconsistent, and vulnerable to bias.

The **AI-Powered Resume and Portfolio Analyzer** aims to revolutionize recruitment by automating resume and portfolio evaluations through advanced artificial intelligence (AI) and machine learning (ML) technologies. These systems analyze vast amounts of data quickly and provide accurate insights into candidates' qualifications and job fit, enhancing efficiency and promoting objective, data-driven evaluations.

A key feature of the AI-Powered Analyzer is its use of **Natural Language Processing (NLP)** to extract meaningful information from unstructured text. By identifying relevant skills, experiences, and educational qualifications, the AI can effectively match candidates to job descriptions.

Additionally, the tool evaluates portfolios, crucial in creative and technical fields where portfolios often outweigh traditional resumes. The AI can scrape project details, assess relevance, and present findings to hiring managers, facilitating informed decision-making.

As AI transforms industries, the recruitment process also evolves. By leveraging machine learning and data analytics, the AI-Powered Resume and Portfolio Analyzer offers personalized recommendations for candidates, including suggestions for upskilling through relevant courses and tailored feedback to improve their applications.

This shift toward AI-driven recruitment tools benefits employers by optimizing candidate selection and empowers job seekers with valuable insights into their professional profiles. As companies increasingly adopt these technologies, the future of hiring will depend on the precision, speed, and scalability that AI provides.

The adoption of AI in resume and portfolio analysis also has implications for reducing employment barriers and fostering a more inclusive job market. By focusing on qualifications and relevant experiences rather than personal identifiers, AI tools help mitigate discrimination related to gender, age, ethnicity, and other biases. This allows for a more diverse and equitable recruitment process. Furthermore, AI-powered systems can be customized to align with different industry needs, providing tailored analysis for specialized sectors such as technology, healthcare, finance, and creative industries. The continuous learning capabilities of AI ensure that the system adapts over time, incorporating feedback and improving its algorithms to stay relevant in an ever-evolving job market.

1.2 Overview of AI-Powered Resume and Portfolio Analyzer

The AI-Powered Resume and Portfolio Analyzer offers a revolutionary approach to job applications by combining the capabilities of LLMs with the growing need for automated evaluation tools. The system analyzes resumes and portfolios, helping candidates understand how well their qualifications align with specific job roles. By using advanced natural language processing techniques, the system can contextualize a candidate's skills and experiences, ensuring that each resume is evaluated based on relevant job descriptions and industry standards. In addition to traditional resume evaluation, the system incorporates data from LinkedIn profiles, enabling a deeper analysis of the candidate's online professional presence. Furthermore, it scrapes portfolio websites to extract details about projects, which helps highlight the candidate's work beyond text-based resumes.

The system provides detailed feedback, identifying strengths and areas for improvement, such as missing skills or experiences, and offers recommendations for relevant courses and certifications to bridge these gaps. Through this comprehensive and dynamic approach, the analyzer optimizes the presentation of a candidate's qualifications, improving their chances of being shortlisted for interviews.

One of the significant innovations of the AI-Powered Resume and Portfolio Analyzer is its integration with Applicant Tracking Systems (ATS), enabling seamless data transfer and improved collaboration between HR departments. The analyzer's machine learning algorithms can learn from historical data within an organization, allowing it to prioritize candidates who have previously succeeded in similar roles. Moreover, the analyzer supports multi-language capabilities, making it suitable for global companies with diverse applicant pools. Enhanced data security measures ensure that candidates' personal data is protected, fostering trust between job seekers and recruiters.

1.3 Challenges in Traditional Resume Evaluation

Traditional resume evaluation processes are fraught with several challenges that hinder their effectiveness. One of the primary issues is the manual and time-intensive nature of reviewing large volumes of resumes, which often leads to inefficiencies in the hiring process. Recruiters are faced with the difficult task of manually scanning and comparing resumes, which can take a significant amount of time and result in delays in candidate selection. Additionally, traditional methods are highly prone to subjectivity and bias. Human evaluators may be influenced by personal preferences or unconscious biases related to the format of the resume, the candidate's educational background, or other non-relevant factors, leading to inconsistent and potentially unfair outcomes.

Another major challenge in traditional resume evaluation is the difficulty in accurately assessing how well a candidate's skills and experiences align with the specific requirements of the job. Recruiters may rely on surface-level keyword matching, which can overlook the deeper context of a candidate's qualifications or fail to consider transferable skills that may be highly relevant to the role. As a result, candidates who might otherwise be a great fit for the position may be overlooked due to these limitations in the evaluation process.

Beyond the challenges of inefficiency and bias, traditional resume evaluation often struggles to incorporate non-linear career paths and unconventional experiences that could be valuable to employers. Candidates with diverse backgrounds, such as freelancers or those who have transitioned between industries, may find their qualifications overlooked due to rigid evaluation practices. Additionally, manual screening limits recruiters' ability to identify soft skills, which can be just as crucial as technical expertise. The lack of real-time updates and feedback also means that candidates remain uninformed about their status in the hiring process, which can negatively affect the candidate experience and employer branding.

Challenges in Traditional Resume Evaluation and Their Impact on Recruitment Efficiency

1. **Inefficiency:** Traditional resume evaluation is often a time-consuming process that requires manual screening of each application, leading to slower recruitment timelines.
2. **Bias:** Human evaluators may introduce unconscious bias, which can result in unfair treatment of candidates based on factors unrelated to job performance, such as gender, race, or educational background.
3. **Overlooking Non-Linear Career Paths:** Traditional evaluation methods may fail to properly recognize candidates with unconventional experiences, such as freelancers or those who have changed industries, potentially overlooking valuable and diverse skill sets.

4. **Limited Identification of Soft Skills:** Manual resume screening typically focuses on technical skills and experience, making it difficult to assess important soft skills that contribute significantly to a candidate's success.
5. **Lack of Real-Time Updates and Feedback:** Candidates often do not receive timely updates or feedback during the recruitment process, leaving them uninformed and potentially damaging the candidate experience and employer brand.

1.4 Opportunities for AI Integration in Job Applications

The integration of AI into the resume evaluation process presents numerous opportunities to address the inefficiencies and biases inherent in traditional methods. AI-powered systems can automate the initial screening of resumes, allowing recruiters to focus on the most qualified candidates based on objective, data-driven analysis. These systems can evaluate large volumes of resumes in a fraction of the time it would take a human, thereby speeding up the hiring process and ensuring that no candidate is overlooked due to human error.

Moreover, AI systems provide more consistent evaluations by analyzing resumes based on predefined criteria, such as keyword relevance, experience levels, and specific job-related skills. This eliminates the variability in human judgments and helps reduce bias in candidate selection. Additionally, AI-driven tools can offer personalized feedback to job seekers, suggesting improvements to their resumes, such as highlighting key skills or reformatting sections for better readability. These systems can also identify gaps in a candidate's qualifications and recommend relevant courses or certifications, enabling job seekers to enhance their employability.

AI integration also brings the opportunity to enhance candidate engagement through interactive interfaces, such as AI-powered chatbots, which can answer questions about the application process, provide status updates, and offer tailored

advice. Additionally, AI can support end-to-end recruitment workflows, from resume screening to interview scheduling and follow-up communications. Advanced analytics and reporting features help hiring managers understand trends in applicant pools, track diversity metrics, and adjust recruitment strategies accordingly. Moreover, integration with career sites and job boards allows AI systems to actively source and match potential candidates, expanding the talent pool and increasing the likelihood of finding top talent.

1.5 Importance of Natural Language Processing in Resume Analysis

Natural language processing (NLP) is a key component in AI-driven resume analyzers, as it enables the system to understand and interpret human language at a nuanced level. Unlike traditional keyword-based systems, which rely on matching specific terms, NLP allows for a more contextual understanding of the resume's content. It can accurately extract and categorize essential information, such as education, work experience, and technical skills, even when the wording or formatting varies across different resumes.

NLP's ability to process language contextually is particularly valuable in resume analysis, where understanding the relevance of a candidate's experience to a job role often goes beyond simple keyword matches. NLP models can identify the significance of a particular skill or project in the context of the job being applied for, providing a more accurate assessment of a candidate's qualifications. Furthermore, by analyzing the tone, structure, and content of resumes, NLP-based systems can generate actionable feedback, helping candidates improve the presentation of their qualifications and tailor their applications to specific job postings.

The integration of NLP into resume analysis marks a significant advancement in how resumes are evaluated, making the process not only more efficient but also

more effective in identifying the best candidates for the job. By leveraging NLP technologies, AI-powered resume analyzers offer a powerful tool for both job seekers and recruiters, transforming the traditional hiring process into one that is more data-driven, objective, and scalable.

NLP not only enhances resume analysis but also empowers the system to handle different languages and cultural nuances, which is crucial for multinational companies. This capability allows recruiters to source talent from various regions without needing additional translation tools. Furthermore, NLP can analyze resumes for tone and sentiment, identifying language that may suggest leadership, teamwork, or initiative. The technology can also parse through dense technical resumes to extract deeper insights, such as the level of proficiency with specific tools or software, thus enabling more refined candidate matching. Enhanced NLP can further integrate with voice data analysis, allowing job seekers to submit audio portfolios or interviews for evaluation, expanding the range of recruitment capabilities.

CHAPTER 2

LITERATURE REVIEW

A scholarly , which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a

basis for research in nearly every academic field. A narrow-scope literature review may be included as part of a peer-reviewed journal article presenting new research, serving to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

2.1 AI Resume Analyzer

In today's dynamic job market, a well-crafted resume is paramount for securing employment opportunities. The AI Resume Analyzer is a comprehensive platform designed to assist job seekers in optimizing their resumes and increasing their chances of success. This paper provides an in-depth overview of the services offered by the AI Resume Analyzer, the technologies utilized, and the benefits it brings to users. The platform includes a Resume Builder that allows users to input their details and preferences to create professional resumes efficiently, offering customizable templates and formatting options to suit diverse career fields.

Additionally, the Resume Analyzer enables users to upload their resumes for a detailed analysis and score, covering aspects such as content relevance, formatting consistency, and keyword optimization, thereby providing actionable insights for improvement. Users can also benefit from the Job Description Matching Score feature, which compares their resumes with job descriptions to determine the alignment of skills and qualifications, aiding in targeted applications. Furthermore, the platform features a Job Portal that provides access to career portals of prominent companies, along with curated resources and tips for enhancing resumes

. The AI Resume Analyzer leverages a range of technologies, including HTML, CSS, JavaScript, Python, NLP (Natural Language Processing), and MySQL, ensuring seamless functionality and personalized user experiences. This paper aims to showcase the innovative features, user benefits, and technological foundations of the AI Resume Analyzer, highlighting its role in empowering job seekers and optimizing the job application process.

The AI Resume Analyzer platform employs a robust architecture that integrates front-end and back-end technologies to ensure an efficient and user-friendly experience. The platform's user interface (UI) is built using **HTML, CSS, and JavaScript**, providing interactive and visually appealing components. The back-end logic is developed using **Python** and **Django**, which facilitate rapid development and scalable application management. To support real-time processing and communication between components, **RESTful APIs** are employed, enabling smooth interactions between the Resume Builder, Analyzer, and Job Portal modules.

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2.2 Smart Resume Analyzer

Smart Resume Analyzer is a project aimed at simplifying the job recruitment process by automating the initial screening of job applications. The system utilizes natural language processing and machine learning techniques to analyze and extract relevant information from a candidate's resume. The extracted

information is then used to evaluate the candidate's qualifications against the job requirements, providing a score that reflects their suitability for the position. In addition to this scoring mechanism, the system offers personalized feedback to candidates, assisting them in improving their resumes and increasing their chances of landing a job. By streamlining the recruitment process for both employers and candidates, Smart Resume Analyzer saves time and enhances the likelihood of identifying the best-fit candidates for open positions. The software effectively extracts critical information such as work experience, education, skills, and achievements, matching them against job descriptions to identify the most suitable candidates.

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2.3 Automated Evaluation of Resumes Using NLP

This paper focuses on the automated evaluation of resumes through advancements in natural language processing (NLP) and deep learning. The research outlines the current methods used for automating the resume screening process, highlighting the limitations of traditional manual methods and the advantages of automation. Various approaches are discussed, including hybrid deep learning frameworks, transfer learning, genetic algorithms, and the use of multi-source data to enhance the accuracy and effectiveness of resume screening. The study emphasizes the role of job descriptions in improving the precision of the screening process. Experimental results indicate that these modern methods outperform conventional resume screening techniques. This research provides valuable insights for human resource managers and recruiters looking to automate the hiring process, allowing them to identify suitable candidates more efficiently and without bias.

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2.4 INTELLIGENT RESUME ANALYZER

This paper presents the Intelligent Resume Analyzer, an AI-based system designed to evaluate and improve candidate resumes. It leverages machine learning algorithms to assess various elements of a resume, such as experience, skills, and education, offering targeted recommendations for improvement. Utilizing natural language processing, text mining, and sentiment analysis, the system analyzes resume content to provide valuable insights into the areas needing enhancement, including layout, language, and spelling, ensuring compliance with industry standards.

The Intelligent Resume Analyzer is beneficial for both job seekers and recruiters. It enables job seekers to optimize their resumes, increasing their chances of passing initial screening processes. For recruiters, it offers a streamlined method to identify the most suitable candidates quickly. The system provides personalized feedback, helping job seekers highlight their qualifications and improve their hiring prospects. Through continuous analysis of job market trends, the Intelligent Resume Analyzer refines its recommendations, providing valuable support in the competitive job search landscape.

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Volume/Issue: 05/04, April 2023

2.5 Automated Evaluation of Resumes Using NLP

This research paper delves into the automation of resume evaluation, leveraging advances in natural language processing (NLP) and deep learning. It reviews various automated screening techniques that replace traditional, time-intensive manual methods, underscoring the efficiency and bias reduction achievable through automation. Key methods explored include hybrid deep learning frameworks, transfer learning, genetic algorithms, and the integration of data from multiple sources to optimize the accuracy of resume assessments. The study also highlights the significant role of job descriptions in refining screening precision. Experimental results show that these modern approaches surpass conventional techniques, providing HR managers and recruiters with tools to streamline candidate selection with enhanced precision and objectivity.

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CHAPTER 3

SYSTEM DESIGN

3.1 System Architecture Overview

The architecture of the **AI-Powered Resume Analyzer** follows a streamlined, linear process, as depicted in the system flow diagram below:



fig 3.1 : system architecture

The **Automated Resume Evaluation System** is designed to streamline the resume screening process, providing job applicants with targeted, actionable feedback to enhance their chances of success. Utilizing advanced **Natural Language Processing (NLP)** techniques and a **Large Language Model (LLM) API**, the system analyzes uploaded resumes or LinkedIn profiles, extracting and interpreting essential details such as skills, education, and work experience.

The process begins when users upload a PDF resume or provide a LinkedIn profile link, which is processed via an API call to the LLM. This model then identifies key information from the resume, including skills, work history, and qualifications. Using this data, the system generates personalized recommendations to improve the resume, focusing on enhancing areas like skills and experience descriptions to better align with industry standards.

This tool not only saves time for both job seekers and recruiters but also enhances the quality of resume content, ultimately supporting a more efficient and unbiased hiring process.

Once the LLM processes the resume, the data moves to the **Resume Processing** phase. During this phase, the system analyzes the extracted features in terms of keyword relevance, resume formatting, and overall alignment with job descriptions or industry standards. After this analysis, the system generates detailed, personalized feedback, suggesting improvements in skills, formatting, or qualifications.

The architecture ensures that each step in the pipeline flows efficiently, enabling quick and accurate resume analysis. The modular nature of the design also allows for flexibility, with potential future integration of additional features such as tailored evaluations for specific industries or role

Key Features

1. User-Friendly Interface

- The system offers an intuitive user interface that guides applicants through the resume upload process. Clear instructions and progress indicators enhance user experience, ensuring seamless interaction.

2. Data Privacy and Security

- Security protocols are implemented to protect sensitive user information. Data encryption during upload and API calls ensures that user data remains confidential and secure throughout the evaluation process.

3. Advanced NLP Techniques

- The system utilizes sophisticated NLP techniques beyond basic keyword extraction. Techniques such as sentiment analysis may be employed to gauge the tone of the resume and assess its suitability for specific roles.

4. Personalized Recommendation

- The feedback generated is not only detailed but also tailored to the individual user. It includes actionable insights on how to enhance their resume's impact, such as specific skills to highlight or the use of industry-standard terminology.

The Automated Resume Evaluation System not only improves the efficiency of the resume screening process but also empowers applicants with valuable insights to enhance their job application strategies. By leveraging cutting-edge technologies and maintaining a focus on user experience and data security, the system positions itself as a crucial tool in modern job searching.

Key Components of AI Resume Analyzer

The AI Resume Analyzer comprises several key components that work collaboratively to provide an efficient and accurate resume evaluation process. Each component plays a crucial role in transforming raw user input into actionable insights, enabling candidates to enhance their job application strategies.

1. User Input

- **Description:** The process starts with User Input, where users can upload resumes in various formats (e.g., PDF, Word) or provide a LinkedIn profile link.
- **Significance:** This initial data is critical as it forms the foundation for the entire analysis process. The system must accommodate different file types and ensure that the uploaded content is accessible and readable.
- **Technical Details:**
 - The system employs libraries such as **pdfplumber** or **PyPDF2** for PDF files and web scraping techniques or APIs for LinkedIn profiles to extract structured data effectively.
 - User input validation ensures that only relevant and properly formatted resumes are processed, enhancing overall accuracy.

2. LLM API Call

- **Description:** Once the user input is captured, an LLM API Call is initiated, where the input data is sent to a large language model for analysis.
- **Functionality:** The LLM interprets the resume, extracting vital information such as skills, work experiences, education, and relevant keywords.
- **Contextual Understanding:** The advanced contextual understanding provided by the LLM enables the system to perform an accurate and nuanced analysis of the resume.

- **Technical Details:**

- The LLM processes the input data using pre-trained transformer models capable of understanding and contextualizing natural language.

The response from the LLM is structured in JSON format, facilitating easy integration into subsequent processing stages.

1. Resume Processing

- **Description:** After the LLM processes the resume, the system enters the Resume Processing phase, where the extracted data undergoes thorough evaluation.
- **Evaluation Criteria:** The system assesses the data based on various criteria, including:
 - **Keyword Matching:** Comparing extracted keywords against job descriptions to ensure alignment with industry-specific terminology and expectations.
 - **Resume Structure:** Analyzing the overall layout, formatting, and coherence of the resume to ensure readability and professional presentation.
 - **Quality Assessment:** Evaluating the completeness of information, looking for gaps or inconsistencies that may detract from the applicant's qualifications.
- **Technical Details:** This phase utilizes additional NLP techniques, including Named Entity Recognition (NER) and syntactic analysis, to further refine the evaluation process and ensure accuracy.

2. Recommendation Generation

- **Description:** The final stage of the process is Recommendation Generation, where the system produces personalized feedback based on the resume's analysis.

- **Personalized Feedback:** The system provides tailored insights that might include:
 - **Formatting Improvements:** Suggestions on how to enhance the visual appeal of the resume, ensuring it stands out to hiring managers.
 - **Skill Highlighting:** Recommendations for emphasizing specific skills that are highly relevant to the targeted job roles, increasing the candidate's attractiveness to employers.
 - **Additional Qualifications:** Identifying potential gaps in qualifications and suggesting relevant certifications or experiences that could bolster the applicant's profile.
- **User-Friendly Reports:** The feedback is compiled into an easy-to-understand report format, providing users with a clear pathway to enhance their resumes and job applications.

CHAPTER 4

PROJECT MODULES

4 MODULES

The project consists of Four modules. They are as follows,

1. *Resume Section Segmentation*
2. *Skills and Experience Feature Extraction*
3. *Candidate Data Aggregation and Profiling*
4. *Job Match and Candidate Alignment Using AI*

4.1 Resume Section Segmentation

This module focuses on detecting and accurately segmenting the different

sections of a resume, such as personal details, education, work experience, skills, certifications, and projects. By leveraging AI and NLP techniques, the system identifies and segregates each section to ensure proper categorization, enhancing the accuracy of further analysis. This segmentation is essential for extracting relevant details for scoring and evaluation, as well as reducing confusion between similar sections, such as differentiating work experience from project descriptions.

The Resume Section Segmentation module is a critical component of the AI Resume Analyzer, focusing on detecting and accurately segmenting the different sections of a resume, such as personal details, education, work experience, skills, certifications, and projects. By leveraging advanced AI and Natural Language Processing (NLP) techniques, the system identifies and categorizes each section, significantly enhancing the accuracy of further analysis. Proper segmentation is essential for effective detail extraction, which contributes to scoring and evaluation. It also helps reduce confusion between similar sections, such as distinguishing work experience from project descriptions.

The output of the segmentation module is a structured representation of the resume, with each section clearly defined and labeled. This structured data serves as a foundation for further analysis, enabling targeted assessments for scoring and recommendation generation. Overall, the Resume Section Segmentation module is fundamental to the functionality of the AI Resume Analyzer, as it enhances data extraction accuracy and improves the overall organization of resumes, ultimately leading to better-optimized resumes for job applications.

4.1 Skills and Experience Feature Extraction

Once the resume sections are segmented, the next critical step is extracting features like skills, qualifications, work experience, and achievements. The

system analyzes both technical and non-technical skills listed in the resume and compares them to the job requirements. It also extracts experience-related data such as job titles, companies, and durations. This feature extraction allows the system to identify gaps, strengths, and relevant qualifications, which can then be used to provide personalized feedback and suggest improvements.

In addition to skills, the feature extraction process focuses on experience-related data, which includes job titles, company names, employment durations, and descriptions of responsibilities and achievements. This data is crucial for constructing a comprehensive profile of the applicant's professional background. The system utilizes techniques like Named Entity Recognition (NER) to accurately identify and categorize these elements, ensuring that each piece of information is appropriately classified.

The insights gained from this feature extraction allow the system to pinpoint the candidate's strengths and areas for improvement. For instance, if a resume lacks certain in-demand skills specified in a job description, the system can flag this gap and provide personalized feedback to the user. Additionally, by analyzing the relevance and impact of previous job roles and accomplishments, the system can suggest how to better articulate these experiences to enhance the overall effectiveness of the resume.

Overall, the Skills and Experience Feature Extraction module plays a vital role in enriching the resume evaluation process. By delivering detailed insights into the candidate's qualifications and experience, the system empowers users to optimize their resumes for specific job opportunities, ultimately increasing their chances of success in the competitive job market.

4.2 Candidate Data Aggregation and Profiling

The system aggregates data from multiple sources, including resumes, LinkedIn

profiles, and portfolio websites, to create a comprehensive profile of the candidate. This aggregation ensures that all relevant data points are considered for evaluation. The profiling process involves assessing the candidate's skills, experience, education, and professional background. The AI model then generates a detailed profile, highlighting key qualifications, potential skill gaps, and areas for further improvement based on the candidate's career goals.

4.3 Job Match and Candidate Alignment Using AI

The final step involves leveraging AI algorithms to compare the candidate's profile with job descriptions and requirements. By analyzing the skills, experience, and qualifications extracted from the candidate's resume and aggregated data, the system evaluates how well the candidate matches specific job roles. It provides recommendations on job fit, suggests roles the candidate is most suited for, and highlights areas where they need to improve to align better with job market demands. This feature can also guide candidates on preparing for interviews by focusing on areas that need attention.

CHAPTER 5

SYSTEM REQUIREMENTS

5. SYSTEM REQUIREMENTS

5.1 Hardware and Software Requirements

To develop and run the AI-Powered Resume and Portfolio Analyzer, the following hardware and software components are necessary:

- Processor: Multi-core CPU (e.g., Intel i7 or AMD Ryzen 7).
- RAM: Minimum 16GB (32GB recommended).

- Storage: SSD with at least 512GB, preferably 1TB.
- GPU: Dedicated GPU (e.g., NVIDIA GTX 1080 or higher; RTX 30 series or A100 for deep learning).
- Hardware Requirements:
 - Processor: Minimum Intel i5 or equivalent (i7 or higher recommended for faster processing)
 - RAM: 8GB (16GB or higher recommended for handling larger datasets and running models efficiently)
 - Storage: At least 500GB HDD or SSD (SSD preferred for faster data access and storage)
 - GPU: A dedicated GPU (NVIDIA GTX 1080 or higher) for accelerating machine learning model training and inference, especially for LLMs.
 - Network: Reliable internet connection for accessing cloud services, datasets, and APIs.
- Software Requirements:
 - Operating System: Windows 10 or higher / macOS / Linux (Ubuntu recommended)
 - Development Environment:
 - Python 3.8 or higher
 - IDE: Visual Studio Code, PyCharm, or Jupyter Notebooks
 - Libraries and Frameworks:
 - TensorFlow / PyTorch (for model training and inference)
 - Hugging Face Transformers (for LLM integration)

- spaCy or NLTK (for NLP tasks such as tokenization and entity extraction).
 - Flask or Django (for building the web application interface)
 - Pandas, NumPy (for data handling and preprocessing)
 - Matplotlib, Seaborn (for visualization of analysis results)
- Database: PostgreSQL / MongoDB (for storing candidate data, resumes, and analysis results)
- Cloud Services: AWS / Google Cloud / Azure (for cloud-based processing and storage)

5.2 Technologies Used

The following technologies are utilized in the development and deployment of the AI-Powered Resume and Portfolio Analyzer:

- Large Language Models (LLMs):
 - GPT-based models (e.g., GPT-3, GPT-4) for analyzing and understanding resume content, generating personalized feedback, and recommending improvements.
- Natural Language Processing (NLP):
 - NLP techniques such as tokenization, named entity recognition (NER), and sentiment analysis are used to extract relevant information from resumes and profile data.
- Machine Learning:
- Supervised and unsupervised learning algorithms for extracting features like skills and work experience, and scoring resumes based on

predefined metrics.

- Cloud Computing:
 - Cloud platforms like AWS or Azure are used for hosting the application, storing large datasets, and enabling scalable processing power for AI-based analysis.
- Web Framework:
 - Flask or Django is used for building the web application interface, allowing users to upload resumes, view analysis results, and receive recommendations in a user-friendly format.
- Databases:
 - MongoDB or PostgreSQL is employed for storing candidate data, resumes, and analysis results in a structured manner for easy retrieval and updates.
- APIs:
 - LinkedIn API integration is used to pull profile data directly from candidates' LinkedIn accounts for a more comprehensive evaluation.
 - REST APIs are used for backend communication between different system components

CHAPTER 6

RESULTS AND CONCLUSION

6.1 RESULTS AND DISCUSSION

The AI-Powered Resume and Portfolio Analyzer is designed to provide candidates with immediate feedback on their resumes, analyzing key factors such as skill relevance, format, and overall alignment with job roles. The prototype implementation yielded an initial assessment system capable of providing feedback based on keywords and general format analysis, as demonstrated in the provided results.



fig 6.1.1 : GUI Interface

The image depicts the user interface, which allows candidates to upload their resumes in PDF or text formats and enter their LinkedIn or portfolio URLs for a comprehensive analysis. This interface is designed for simplicity and user-friendliness, guiding candidates through the upload process and giving them immediate access to feedback and suggestions for improvement.



fig 6.1.2 : Resume Analyzer

As shown in the images, the initial output provides an “Overall Score” based on identified keywords relevant to the job role. For instance, in one example output, the system recognizes a keyword such as "Python" and assigns a preliminary score based on its relevance.

This implementation serves as a preliminary proof of concept for the AI-Powered Resume and Portfolio Analyzer. While the initial results are promising, further work is required to develop a fully comprehensive and sophisticated tool. Future enhancements will involve refining the scoring algorithms, expanding NLP capabilities, and adding more job-specific insights to ensure a deeper, more accurate evaluation process.

6.2 CONCLUSION

In conclusion, the AI-Powered Resume and Portfolio Analyzer represents a significant advancement in the recruitment landscape, addressing the inefficiencies and biases inherent in traditional resume evaluation methods. By leveraging cutting-edge technologies such as Large Language Models and Natural Language Processing, this system provides a comprehensive and automated approach to resume analysis. It not only streamlines the evaluation process but also empowers job seekers with personalized feedback and actionable insights, ultimately enhancing their chances of securing employment. As the job market continues to evolve, integrating AI into the recruitment process will pave the way for more

efficient, transparent, and equitable hiring practices. Future developments in this project aim to expand its capabilities, further improving the user experience and job matching accuracy, thus ensuring that both candidates and employers benefit from this innovative tool.

In conclusion, the AI-Powered Resume and Portfolio Analyzer signifies a transformative shift in the recruitment landscape, effectively tackling the inefficiencies and biases that often plague traditional resume evaluation methods. By leveraging cutting-edge technologies such as Large Language Models (LLMs) and Natural Language Processing (NLP), this system introduces a comprehensive and automated approach to resume analysis that enhances the overall hiring experience for both candidates and employers.

The ability of the system to streamline the evaluation process is particularly noteworthy. It efficiently processes resumes by segmenting them into distinct sections, extracting relevant features, and analyzing candidates' skills and experiences against the requirements of specific job roles. This automated workflow not only reduces the time and effort involved in manual resume screening but also increases the accuracy of assessments, ensuring that candidates are evaluated based on objective criteria rather than subjective impressions.

Moreover, the AI-Powered Resume and Portfolio Analyzer empowers job seekers by providing personalized feedback and actionable insights tailored to their unique profiles. Candidates receive specific recommendations on how to enhance their resumes, from highlighting essential skills to improving formatting and clarity. This feedback is invaluable, as it equips job seekers with the tools they need to present themselves effectively in a competitive job market, thereby significantly enhancing their chances of securing employment.

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