



Delta University



Faculty of Artificial Intelligence

## PROJECT HANDBOOK

# Automated Interview Process Based on NLP and Computer Vision

المقابلة الآلية الشخصية  
المبنية على معالجة اللغات الطبيعية ورؤية الحاسوب

Submitted in Partial Fulfillment of the Requirements for Work-Based Professional Project in Computer Science CSC 227

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## **Introduction:**

We created a mock company, Cyber Cloud, to simulate the entire interview process, from the job advertisement to the actual interview. This helps employees develop their skills and makes the work of employers easier.

### **• Project Contributions**

STUDENT NAME	STUDENT ID	PROJECT PART	KEY RESPONSIBILITIES
Noor Hossameldin Shamseldin	4221290	An Intelligent Resume Analyzer Website	Developed the core functionalities of the resume analyzer, focusing on key algorithms for natural language processing and user interface design.
Osama AlHussein AbdAljalil	4221147	An Interview Bot	Designed and implemented the interview , ensuring the integration of NLP and establishing a strong foundation for future developments, such as a robust database setup for data management.
Ahmed Saad Mohamed	4221124	CV Image Suitability Verification	Worked on verifying the suitability of images for CVS, utilizing neural networks and computer vision techniques to ensure high quality, professional profile pictures.

### **• Additional Project Details**

QUESTION	ANSWER
Participation in Local or International Competitions?	Still in progress as we continue to develop and improve daily; no suitable competition has been identified yet.
Preparation or Publication of a Research Paper?	Yes, about "How to Select Keywords for Non-Specialists".
Collaboration with External Beneficiaries?	Yes, Delta University for Science and Technology to implement the model, and a Saudi Arabian Real estate website ,to help in the job application process
Future Development Plans for the Project?	Adding more features for companies and individuals, improving keyword calculation methods, and enhancing the interview feature to include audio and video functionalities.
Additional Notes	The title includes "Computer Vision" considering future developments. Although the focus on this aspect was limited this term, it's crucial for our development goals.
	For the interview bot, this semester's focus was on establishing a strong foundation to simulate a company's full process, emphasizing a robust database and core features

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# **Chapter 1: Introduction**

## **1.1 Overview**

Today, with the advancement of job hunting pace, an effective means of linking up job seekers and employers is important. The conventional methods of analyzing resumes and conducting interviews is time consuming and mostly arbitrary. Therefore; we present a project called "Automated Interview Based on NLP and Computer Vision" which will reduce work search process by introducing automation through its two key features:

- An intelligent resume analyzer website
- An interview bot.

## **1.2 Why this project?**

Job seekers often face the issue of having their resumes overlooked despite having the necessary skills and experiences. Common problems include formatting issues, lack of clarity, and missing keywords that automated systems or hiring managers prioritize. This leads to qualified candidates being rejected early in the application process.

Employers, on the other hand, are overwhelmed with the task of sifting through numerous resumes, which is both time-consuming and prone to subjective biases. They need a more efficient and objective way to filter and evaluate candidates.

## **1.3 Problem Statement**

Our project addresses the following issues:

For Job Seekers: Ensuring that resumes are not rejected due to common mistakes or lack of specific keywords, and providing a platform to refine their applications.

For Employers: Offering a tool to automate the initial screening process, reducing the time and bias associated with manually sifting through resumes.

## **1.4 Goals / Objectives**

Develop an intelligent resume analysis website that utilizes NLP to analyze and improve resumes.

Create an interactive interview bot that uses computer vision and NLP to conduct mock interviews and provide feedback.

Provide a platform that connects job seekers with suitable job opportunities based on their skills and experiences.

## **1.5 Contribution**

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- **Resume Analyzer Website:** Utilizes NLP algorithms to analyze resumes, identify errors, suggest improvements, and provide personalized job recommendations. This ensures that resumes are ATS-compliant and enhances the overall quality of applications.
  - **Interactive Interview Bot:** Conducts mock interviews, provides performance assessments, and generates detailed feedback reports to help candidates prepare effectively for real interviews
-

## Let's Dive into Each feature

### First feature: Resume Analyzer Website

#### Problem Solved:

The primary challenge we address with our resume Analyzer website is the rejection of resumes that do not make it past the initial screening, despite candidates possessing the necessary qualifications. This often happens due to common mistakes such as poor formatting, lack of specific keywords, and other overlooked details that are crucial for resume selection.

#### Solution:

Our system leverages advanced Natural Language Processing (NLP) algorithms to thoroughly analyze resumes or CVs based on specific criteria used by Applicant Tracking Systems (ATS). By doing so, it identifies key skills and experiences, pinpointing any mistakes or areas for improvement. The website then provides personalized job recommendations, insightful tips, and resources to help candidates refine their applications. This automated evaluation not only saves time but also ensures a more objective and comprehensive assessment of candidates' qualifications.

#### Features and Benefits:

1. Error Identification and Correction: The system highlights errors and suggests improvements, enhancing the overall quality of the resume.
2. ATS Compliance: Ensures that resumes are optimized according to ATS criteria, increasing the likelihood of passing initial screenings.

3. Personalized Job Recommendations: By analyzing the candidate's skills and experiences, the system recommends suitable job opportunities.
4. Resource Provision: Offers valuable resources and tips to help candidates enhance their resumes.
5. Employer Utility: Companies can use this tool to filter submitted resumes, automatically send rejection emails with feedback, and streamline the initial screening process without human intervention.

### **Second feature:** Interactive Interview Bot

#### **Problem Solved:**

The second challenge our project addresses is the anxiety and lack of experience candidates face during real-life interviews. This can significantly impact their performance, leading to missed job opportunities even when they are well-qualified.

#### **Solution:**

Our interactive interview bot conducts mock interviews, asking a series of tailored questions and evaluating the responses. The bot provides a final assessment, generating a detailed report on the candidate's performance. This report includes feedback on strengths and areas for improvement, helping candidates build confidence and prepare more effectively for actual interviews.

## Features and Benefits:

1. Mock Interviews: Simulates real interview scenarios, helping candidates practice and gain confidence.
2. Performance Assessment: Using ChatGPT API, it evaluates responses and provides objective feedback.
3. Detailed Reporting: Generates comprehensive reports highlighting strengths and areas needing improvement.
4. Improved Preparation: Helps candidates better prepare for real interviews by identifying weak points and suggesting enhancements.

So , our project not only enhances the efficiency and objectivity of the job application process but also empowers candidates to present their best selves. The resume analyzer website ensures that qualified candidates are not overlooked due to easily rectifiable mistakes and that their resumes are ATS-compliant, while the interview chat bot helps them overcome interview anxiety and lack of experience. Together, these components streamline the hiring process for both job seekers and employers, making it more effective and equitable.

---

## **Chapter 2: Background and related work**

### **Background 2.1**

The integration of Natural Language Processing (NLP) and Computer Vision technologies has opened new avenues for automating and enhancing various aspects of the job recruitment process. The background section delves into the foundational concepts and technologies that underpin our project. In this section, we have utilized most of the materials studied during our university courses. We will detail this further, and we have attached a document titled "Interdependencies of Academic Courses and Their Application in Project Development."

### **2.2 Related Work**

This section reviews existing literature and technologies related to automated resume analysis and interview processes and the links will be in reference section.

#### **Automated Resume Analysis**

Most companies now use systems that analyze resumes before HR personnel review them, acting as a filtering mechanism. This approach helps streamline the recruitment process and ensure that only qualified candidates move forward.

#### **Interview Systems**

Training bots for interviews are also being used to help candidates prepare for job interviews. These bots simulate real interview scenarios, providing candidates with valuable practice and feedback.

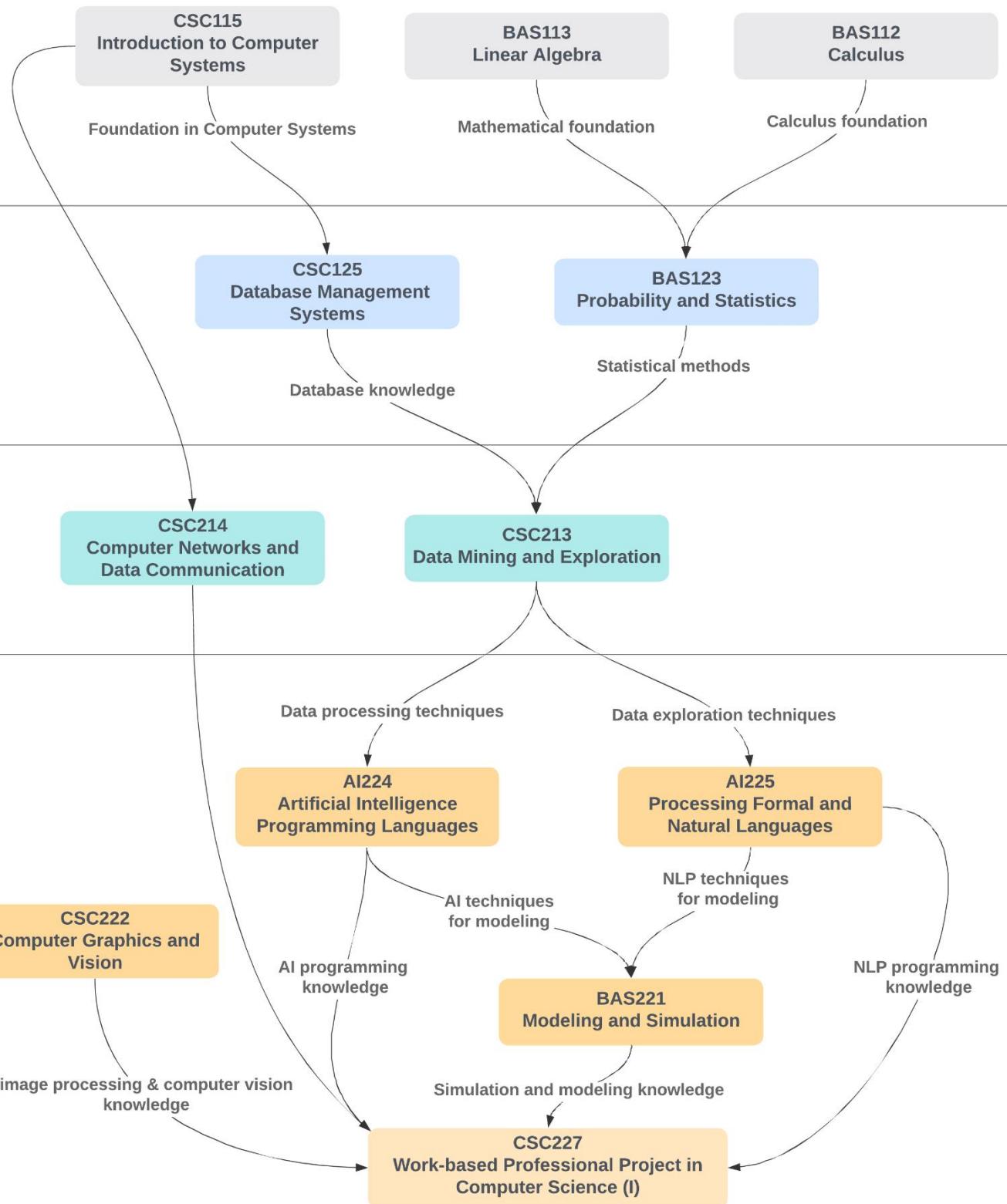
## **2.3 Disadvantages and Solutions**

Our project wants to make finding jobs better with new tech, but we hit some bumps. Right now, spotting the right words isn't as sharp as with the simpler Naive Bayes way. We're on it, trying to get better at finding these key words to match people and jobs well.

The way we check job seekers now is through text chats, which might not fully show how well they talk or fit a job. So, we're thinking of adding a video talk feature later. This will let us see more about how people act and talk in real interviews, giving bosses a clearer view of their social skills and how they come across.

Furthermore, while our automated system significantly reduces the time and effort required for initial resume screening and interview preparation, there is a potential risk of users being hesitant to trust and adapt to a fully automated process. To mitigate this, we are committed to providing transparent explanations of how our system works, detailed user guides, and robust customer support to help users feel more comfortable and confident in using our platform.

## Interdependencies of Academic Courses and Their Application in Project Development



## **2.4 Relevant University Courses with Details**

In developing our project, we utilized knowledge and skills acquired from various university courses. While many courses contributed to different aspects of the project, we will highlight the most significant ones:

### **CSC125 - Database Management Systems**

This course provided us with the essential knowledge to design and implement robust databases. We applied these skills to store user data and related information efficiently. The database management system allows us to securely store, retrieve, and manage user data, which is crucial for displaying information on the admin page and for future use in our application.

### **BAS123 - Probability and Statistics**

Probability and statistics play a crucial role in our project, particularly in the analysis and recommendation features. For instance, statistical methods help us understand user trends and improve the accuracy of job and skill recommendations by evaluating the likelihood of various outcomes.

### **CSC214 - Computer Networks and Data Communication**

Knowledge from this course was applied to ensure efficient and secure data communication within our system. Understanding computer networks helped us design a system architecture that supports reliable data transfer between different modules of our application, ensuring that user data and recommendations are processed and delivered seamlessly.

## CSC213 - Data Mining and Exploration

This course was instrumental in enabling us to present job data in various formats. We applied data mining techniques to extract valuable insights from large datasets, which helps in matching users with the most relevant job opportunities. The skills learned in this course were also critical in visualizing job recommendations through bar plots and other graphical representations.



## AI224 - Artificial Intelligence Programming Languages

In this course, we learned about neural network techniques. We used this knowledge to develop the computer vision model that assesses the acceptability of profile pictures. This model ensures that uploaded images meet certain standards, enhancing the overall quality of user profiles.

## AI225 - Processing Formal and Natural Languages

The core of our project is built on Natural Language Processing (NLP). This course provided us with the foundational knowledge to process and analyze text data. NLP techniques are used throughout our system to parse resumes, extract relevant information, and generate personalized recommendations, making this course indispensable to our project.

## BAS221 - Modeling and Simulation

Our project involves simulating the interview process, making this course highly relevant. The concepts and techniques learned in modeling and simulation were applied to create realistic interview scenarios and responses, providing users with a practical and immersive experience.

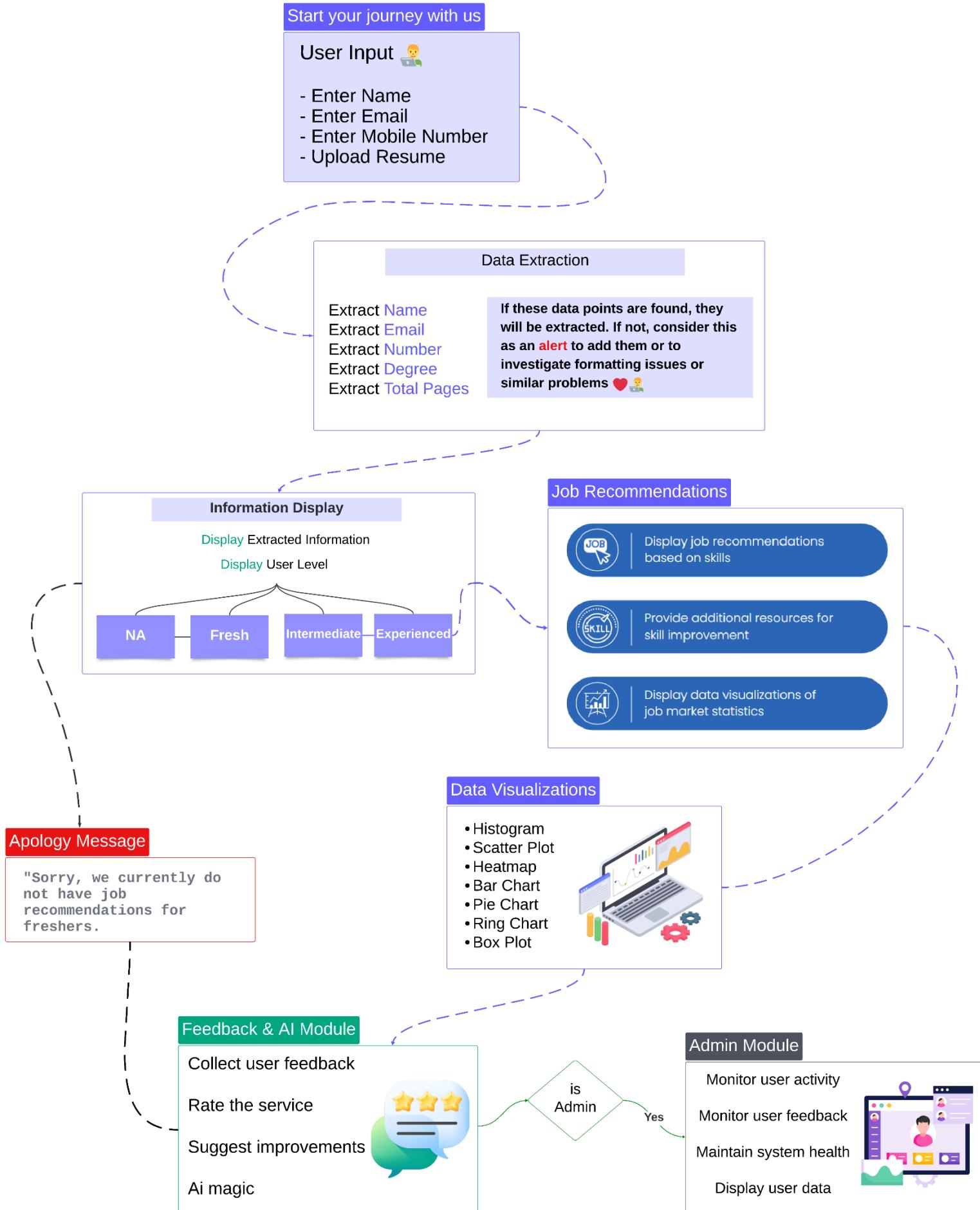
## CSC222 - Computer Graphics and Vision

This course was essential for developing our computer vision model that evaluates profile pictures. We applied the principles of computer graphics and vision to ensure that the images are processed accurately and meet the desired criteria, enhancing the visual aspect of our application.

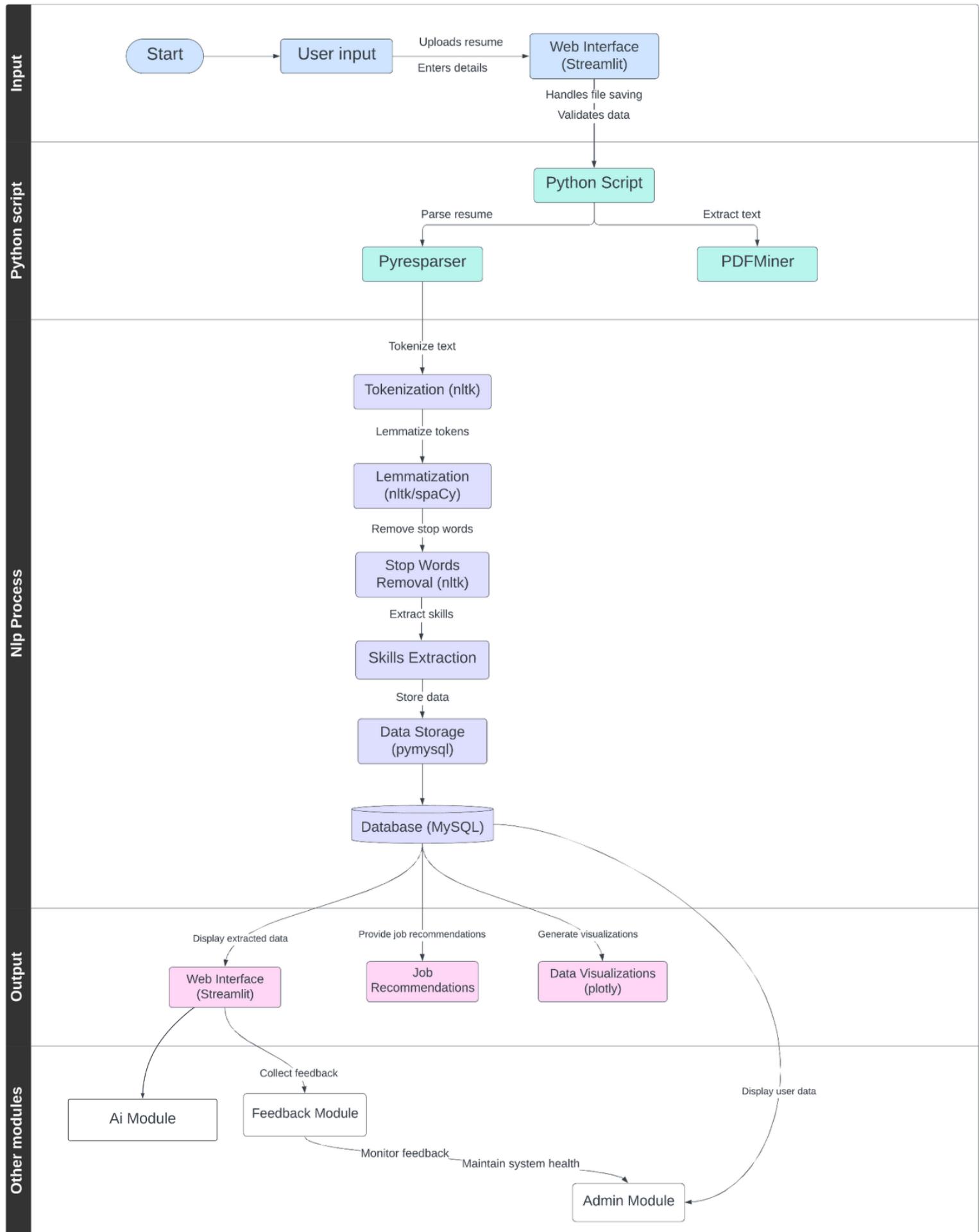
## CSC227 - Work-based Professional Project in Computer Science (I)

This course taught us the principles of project management and professional practices in computer science. The knowledge gained was crucial in planning, executing, and managing our project effectively. It helped us in setting realistic goals, managing timelines, and coordinating teamwork, ensuring the successful completion of our project.

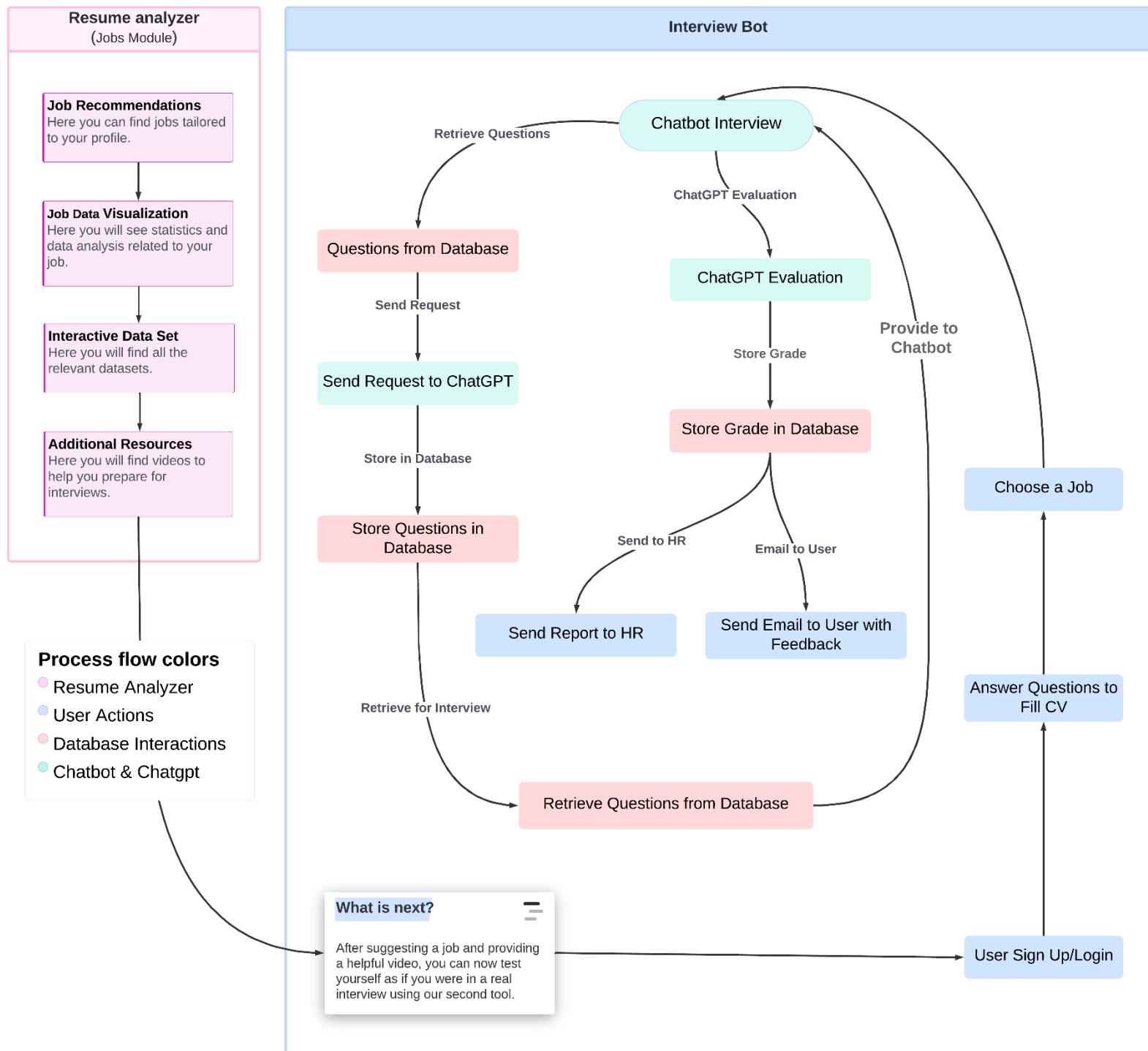
# Chapter 3: Proposed Solution

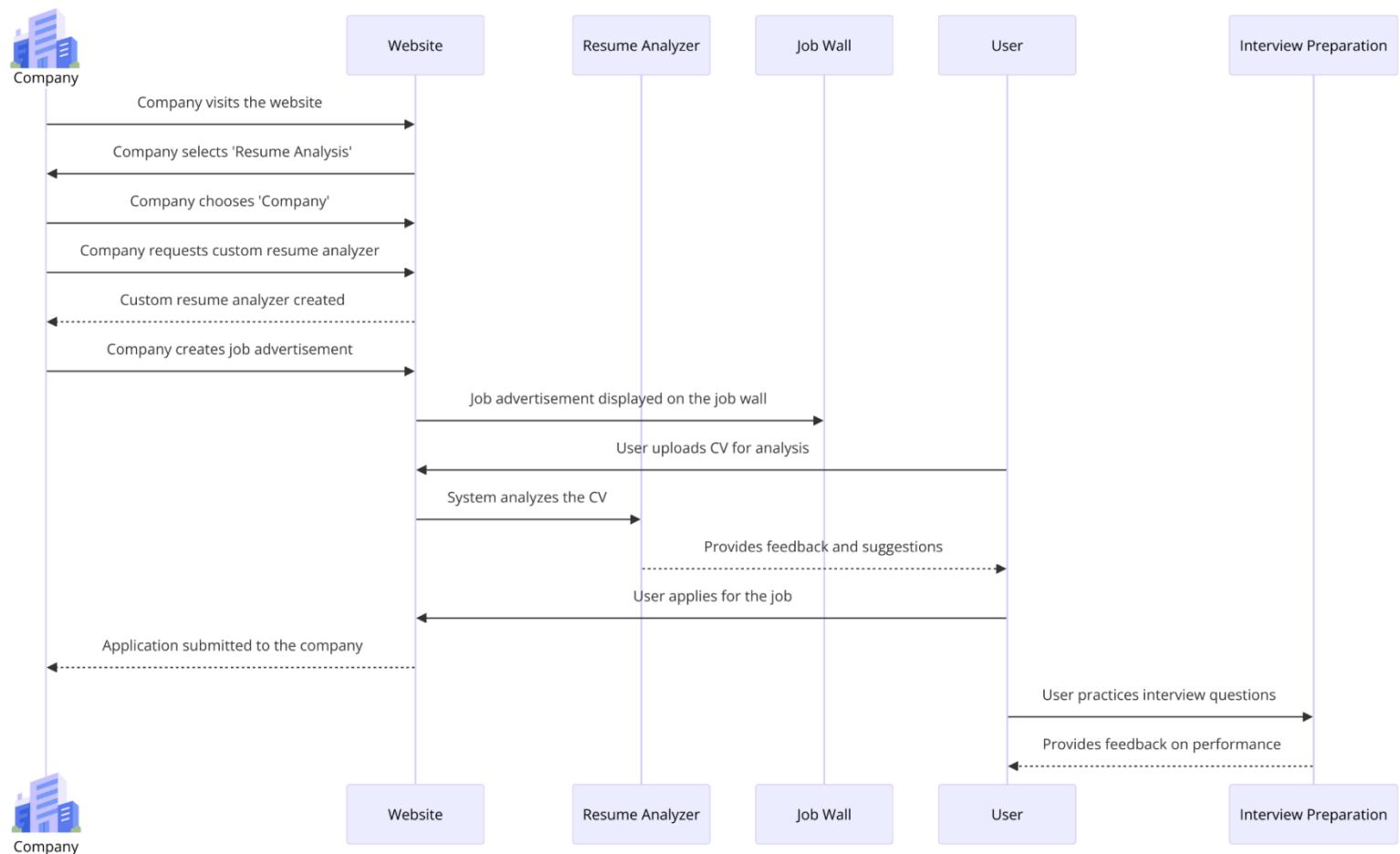


## The Last Architecture and the Following Flow Chart for The Resume Analyzer



## Integration Between Resume Analyzer and Interactive Interview Bot in Our Project





For example, a company visited the website to improve its hiring process. They selected the 'Resume Analysis' option and identified themselves as a company. The company then requested a custom resume analyzer tailored to their specific needs. The website swiftly generated the custom tool for them.

And also created a job advertisement, which was displayed on the website's job wall for job seekers to see. A job seeker, eager to apply, visited the website and uploaded their CV for analysis. The system analyzed the CV and provided detailed feedback and suggestions for improvement.

The job seeker made the recommended changes and applied for the job. The application was submitted to the company for review. To prepare for the interview, the job seeker used the website's interview preparation module, practicing questions and receiving valuable feedback on their performance.

# Resume Analyzer

## Initial User Choice and Pathways

At the beginning of their journey, users must select whether they are a Company or an Individual. This initial choice determines the subsequent steps they will follow in the system:

### 1. Individual Path:

Personal Information and CV Upload: Individuals will be asked to enter their personal details and upload their CVs.

- **CV Validation:** Using the ChatGPT API, the system will analyze the uploaded CV to determine if it is valid. The validation process checks for completeness, proper formatting, and relevant keywords.
- **CV Acceptance:** Once the CV is deemed valid, the user will proceed to the next steps, where they can access various features designed to enhance their job search experience.

### 2. Company Path:

Companies will be prompted to enter their contact information.

## **Features:**

- **Job Advertisement Creation:** Companies can create detailed job postings, specifying job title, description, requirements, and benefits.
  - **Custom CV Filtering Site:** A dedicated feature allows companies to create a custom site to filter incoming CVs. This site utilizes advanced algorithms to rank and sort CVs based on the job requirements, making the recruitment process more efficient. Detailed explanations of this feature will be provided.
- 

## **Individual Path**

It is divided into five main modules: User, Feedback, Jobs, Admin, and AI, each serving a critical role in the overall system.

### **User Module**

The User module enables candidates to upload their resumes for analysis. Using advanced NLP and Computer Vision, the system generates comprehensive insights into their skills and experiences, facilitating personalized recommendations and enhancements to their employability.

## **Feedback Module**

In the Feedback module, users can share their opinions and address any concerns they may have regarding the platform or the recruitment process. This feature ensures continuous improvement by incorporating user input and suggestions.

## **Jobs Module**

The Jobs module utilizes the analyzed resume data to suggest relevant job opportunities tailored to each candidate's profile. It provides detailed job descriptions and requirements, streamlining the job search process for candidates. The module also utilizes data mining to present information about job opportunities, allowing candidates to visualize the job market.

## **Admin Module**

The Admin module offers administrators access to user data, feedback, and system performance metrics. It enables monitoring, management, and customization of the platform to meet evolving needs and maintain operational efficiency.

## **Ai Module**

The user can access the AI analysis results of their skills and engage in conversation with the chatbot to ask any job-related questions they may have.

## Chapter 4. Modules and Features

- Lets will explain each of them in detail

### 1. User Module:

#### Uploading the Resume:

The user begins by entering their personal information such as name, email address, and contact number. For instance, Asmaa, a cyber security engineer, provides her details and uploads her resume to the system.

Name\*

Asmaa

Mail\*

asmaa@gmail.com

Mobile Number\*

01000000000

#### Upload Your Resume, And Get Smart Recommendations

Choose your Resume



Drag and drop file here

Limit 200MB per file • PDF

Browse files

#### Resume Analysis and Data Display:

Once Asmaa uploads her resume, the system uses advanced Natural Language Processing (NLP) techniques to analyze the document.

The system extracts key information and displays it back to Asmaa for verification and also to tell her if some information was written incorrectly or does not exist. This includes details such as her name, email, contact number, degrees, and the total number of pages in her resume.

## Your Basic info

Note 🌟: If you find any incorrect information, you may have written your CV incorrectly. Send us the problem in the feedback section, and we will try to help you.

Name: ASMAA WEBSTER

Email: jamal.bridges@gmail.com

Contact: 916-555-5555

Degree: ['Bachelor of Science, Computer Information Science', 'Practical Network Pen

Resume pages: 1

### - Experience Level Assessment:

The system then assesses the user's experience level, categorizing them as a beginner, intermediate, or expert. This assessment is crucial as it tailors the subsequent recommendations and feedback to the user's specific career stage. For example, a beginner might receive different advice compared to an expert in the field.

You are at experience level!

## - Skill and Job Recommendations:

Based on the detailed analysis of the resume, the system identifies the user's current skills and suggests relevant job opportunities. This feature utilizes keyword analysis to match the user's profile with potential job openings.

## Your Current Skills

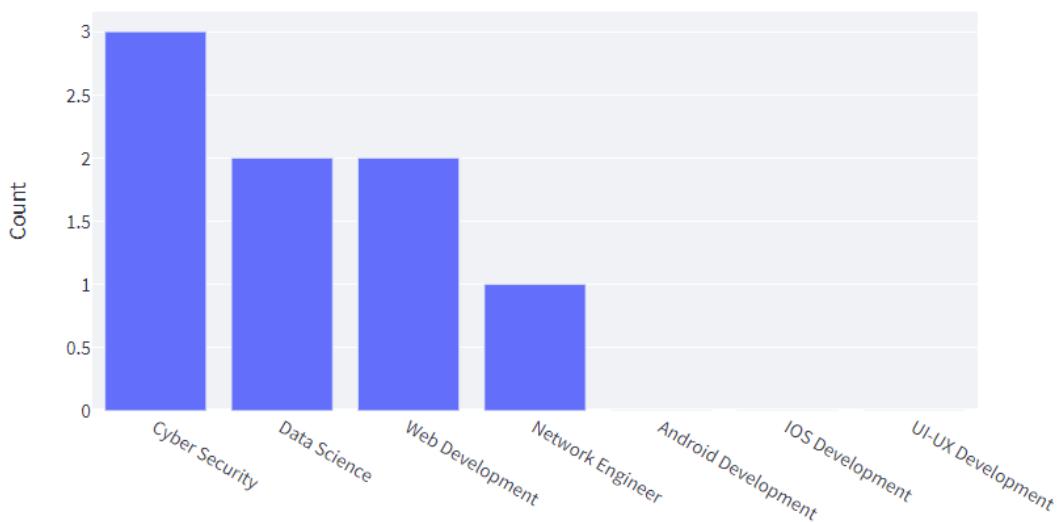
Training X | Linux X | Reports X | Java X | Mobile X | Php X | Testing X  
Programming X | Analysis X | Surprise X | Protocols X | Security X  
Certification X | Video X | Contracts X | Python X | Sql X

See our skills recommendation below

Our analysis says you are looking for Cyber Security Jobs

A bar plot visually represents the closest job matches, providing a clear and intuitive overview of the best-fit roles for the candidate.

Final Count of Job Categories



## - Courses & Certificates Recommendations:

Recognizing the importance of continuous learning and skill enhancement, the system offers recommendations for courses and certifications. Users can choose the number of recommendations they wish to see, ranging from a single course to multiple options. These recommendations are tailored to bridge any skill gaps identified during the resume analysis, thereby boosting the user's employability.

### Courses & Certificates Recommendations

Choose Number of Course Recommendations:

5

1 10

- (1) [Information Security and Cryptography](#)
- (2) [Learn Golang](#)
- (3) [Security Books](#)
- (4) [Everything API Hacking](#)
- (5) [Web Application Penetration Testing Course \(arabic\)](#)

## - Resume Improvement Tips:

To further assist candidates in optimizing their resumes, the system provides personalized tips and suggestions.

These tips cover various aspects of resume building, such as adding hobbies to showcase personality, including interests to demonstrate well-roundedness, and highlighting certifications and projects to prove specialized knowledge and experience.

Adding these skills to your resume will boost the chances of getting a Job 🤖

## \*\*Resume Tips & Ideas \*\*

[+] Awesome! You have added Objective/Summary

[+] Awesome! You have added Education Details

[+] Awesome! You have added Experience

[+] Awesome! You have added Internships

[+] Awesome! You have added Skills

[ -] Please add Hobbies. It will show your personality to the Recruiters and give the assurance that you are fit for this role or not.

[ -] Please add Interest. It will show your interest other than the job.

[+] Awesome! You have added your Achievements

[ -] Please add Certifications. It will show that you have done some specialization for the required position.

[ -] Please add Projects. It will show that you have done work related to the required position or not.

The system also assigns a resume writing score, offering a quantitative measure of the resume's effectiveness.

### Resume Score

\*\* Your Resume Writing Score: 69\*\*

### Bonus Video for Resume Writing Tips



Additionally, users receive access to bonus materials such as video tips for further improving their resume writing skills.

## 2. Jobs Module:

The jobs module connects users with real job opportunities. It analyses users' profiles and matches them with suitable listings. This saves time for job seekers and helps them find good fits. Employers also benefit, as the module identifies suitable candidates for them.

### Experience Level Check

Upon analyzing the user's resume, the system first checks the user's experience level:

If the user is classified as "[Fresher](#)" or if the experience level is "[NA](#)" the system displays an apology message, indicating that there are currently no suitable job matches.

### Oops!

It seems this page is exclusively reserved for the [Experienced](#) or [Intermediate](#) level. But hey, chin up! 😊 Head on over to our [user page](#) where we've got a treasure trove of advice waiting just for you! 🎉

Let's turn this little setback into a golden opportunity for growth! 🚀 So, grab your virtual gear, lace up those learning boots, and let's embark on an adventure to level up your skills! 💪

Warmest regards,  
Cyber cloud Team 

If the user is classified as "Experienced" or "Intermediate" the system proceeds to the next step.

# Welcome to our Job Section!

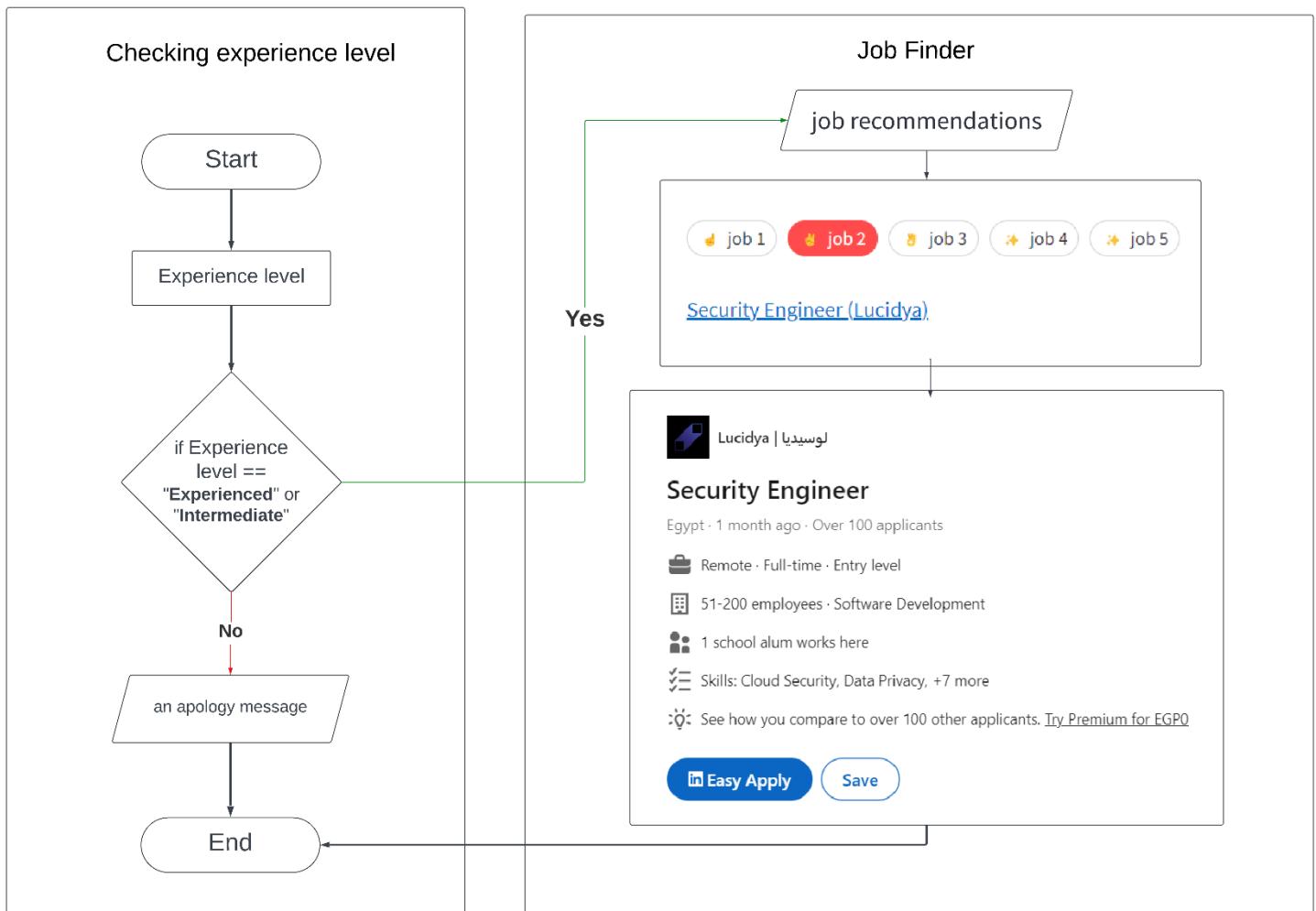
Hello our in our Cyber Security job profile 🎉 ❤️ ! May Allah make you the best in this field.

There are some job recommendations based on your skills

But If you find a job that requires more experience, consider it as an opportunity to learn and grow.  
There are always ways to improve and develop your skills.

Additionally, There are some statistics in your career in bellow 📊

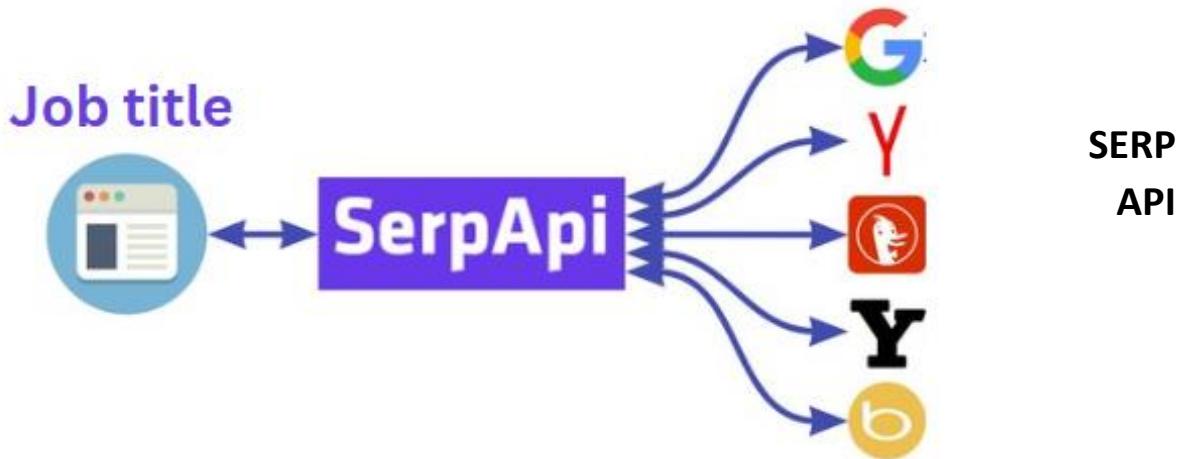
## Flow Chart for Determining User Experience Level and Job Recommendation Process



## The system suggests five job opportunities:

Three of these jobs are sourced from [LinkedIn](#) and [WUZZUF](#).

Two jobs are sourced using the [SERP API](#).



## Integration

We used [SERP API](#) to fetch job listings from Google Jobs.

It allows us to perform real-time web scraping, accessing up-to-date job postings without the need for manual data entry. This integration ensures that users receive the latest job opportunities relevant to their skills and experience.

The screenshot shows a search for "Java Developer" on Google Jobs. The results page includes filters for Title, Location, Date posted, Requirements, and Type. Job listings are shown, such as a Java Developer position from Dice. The code editor on the right shows the Python code used to integrate with the SERP API:

```
</> GET  
https://serpapi.com/search.json?engine=google_jobs&q=Java+Developer&ltype=1  
</> Code to integrate | Python  
from serpapi import GoogleSearch  
  
params = {  
    "engine": "google_jobs",  
    "q": "Java Developer",  
    "ltype": "1",  
    "hl": "en",  
    "api_key": "secret_api_key"  
}  
  
search = GoogleSearch(params)  
results = search.get_dict()  
jobs_results = results["jobs_results"]
```

Additionally, there is a wall to display the jobs that companies have posted with us.

# Job Data Visualization



## In the previous figure:

The visualizations demonstrated how data is presented to users as a model for Cyber security job, similar to what Asmaa experienced on our platform. We showcased a variety of visualizations tailored to provide a comprehensive understanding of the job market for Cyber security ([Heatmap](#), [Pie Chart](#), [Bar Chart](#), [Scatter Plot](#), [Histogram](#), [Box Plot](#) and [Ring Chart](#)).

This collection of visualizations aims to empower users like Asmaa with valuable insights into the Cyber security job market, enabling them to make informed decisions about their career paths.

## Interactive Data Set

Users can interact with the job data set used for these visualizations. They have the ability to

- Control the number of columns and rows displayed.
- Transpose the data set to switch between rows and columns for easier analysis.

All Dataset 

Choose number of rows to display

5  1247

Select columns to show

job\_title x salary\_in\_usd x ✖️ ▾

Choose display option

Regular ▼

	job_title	salary_in_usd
0	Cyber Program Manager	63000
1	Security Analyst	95000
2	Security Analyst	70000

## Additional Resources

To further assist users, the system includes a "Bonus Video for Interview Tips" section, providing valuable insights and tips to help users prepare for job interviews.

### Bonus Video for Interview Tips💡



### 3. Feedback Module:

Understanding that user experience is paramount, the project includes a comprehensive feedback module. This feature is designed to gather valuable insights from users regarding their experience with the system. It allows users to provide detailed feedback, rate the service, and suggest improvements. This feedback is crucial for the continuous enhancement of the system, ensuring it remains user-friendly and effective.

#### Feedback Form:

The feedback form is structured to collect essential information and feedback from users. It consists of the following fields:

Feedback form

Name

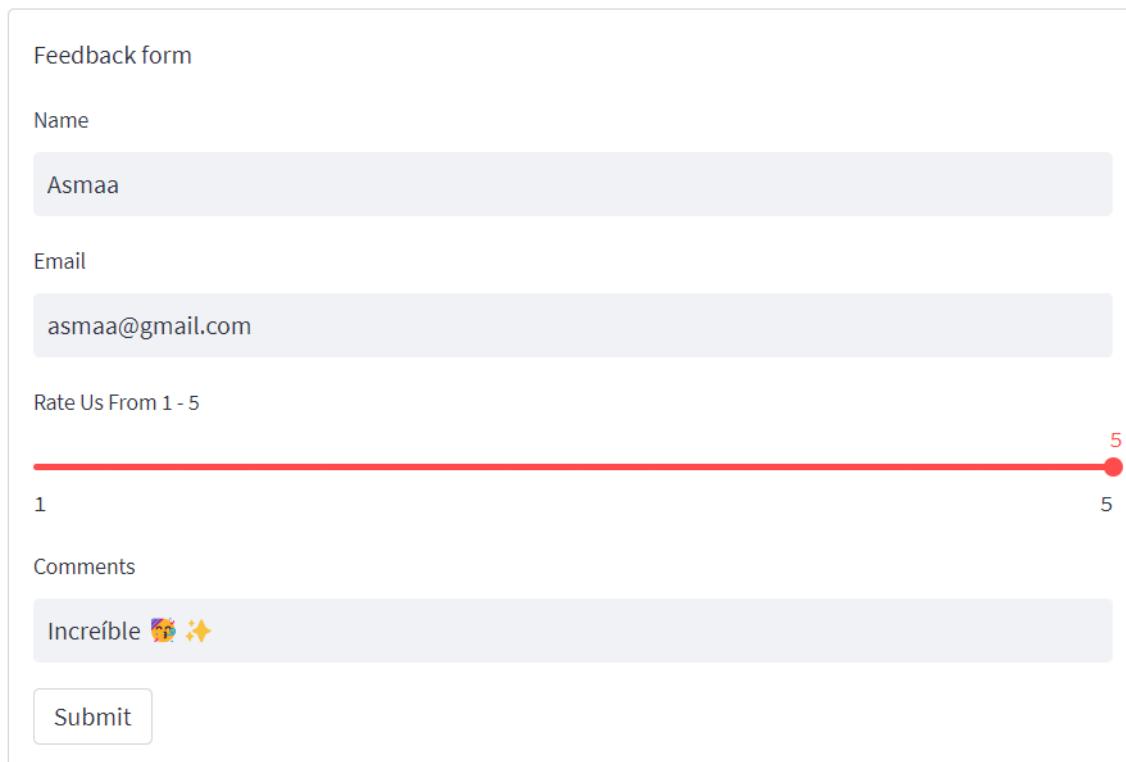
Email

Rate Us From 1 - 5

1 5

Comments

Submit



- **Name:** Users provide their name to personalize their feedback.
- **Email:** Users enter their email address, enabling the support team to respond to their feedback or inquiries.
- **Rate Us From 1 - 5:** Users rate their experience with the system on a scale from 1 (poor) to 5 (excellent). This rating helps in understanding overall user satisfaction.
- **Comments:** Users leave detailed comments about their experience. This field is open-ended, allowing users to express their thoughts, suggest improvements, or report any issues they encountered.

### **Purpose of the Feedback Form:**

- **User Experience:** To gauge how users feel about their overall experience with the system, helping to identify strengths and areas for improvement.
  - **Error Reporting:** Users can report specific issues or errors they encountered, such as inaccuracies in their CV analysis. This allows the support team to address and resolve problems promptly.
  - **Suggestions:** Users can suggest new features or improvements to existing ones, contributing to the system's evolution and better alignment with user needs.
-

#### 4. Admin Module:

The admin module is designed for system administrators to manage and oversee the entire platform. This module includes features for monitoring user activity, managing job listings, handling user feedback, and maintaining the overall health of the system. Administrators can ensure that the platform operates smoothly, addressing any issues that arise and implementing updates as needed. This module is crucial for maintaining the integrity and efficiency of the system.

#### Admin Login

- Email and Password: Administrators enter their email and password to access the admin dashboard.

Username

Password

 eye icon

Login

The default username and password are both set to "admin" However, it is **crucial** to change these credentials immediately, as they are highly predictable and vulnerable to attackers.

## Admin Dashboard Features

### 1. User Statistics:

- Total Users: Display the total number of users who have used the tool.

Welcome 🎉 ! Total 11 User's Have Used Our Tool :)

### 2. User Data Management:

**Stored User Data:** Present all stored user data in a DataFrame format.  
This includes the following fields:

(Token ,IP Address, Name, Mail, Mobile Number, Predicted Field, Timestamp, Predicted Name, Predicted Mail, Resume Score, Total Page, File Name, User Level, Actual Skills, Recommended Skills, Recommended Course, City, State, Country, Lat Long, Server OS, Server Name and Server User )

	Token	IP Address	Name	Mail	Mobile Number	Predicted Field	Timestamp
0	A83sY_cr2BdiEwl5	192.168.1.7	zainab	DrZainab@gmail.com	01012217332	UI-UX Development	2024-05-12_20:21:44
1	XMjXz4_tz-9Em8Ld	192.168.1.4	noor	no0orhosam.0@gmail.com	01012217332	NA	2024-05-23_09:29:06
2	QXD2muXDvThQc4Oc	192.168.1.4	noor	no0orhosam.0@gmail.com	01012217332	Cyber Security	2024-05-23_09:33:37
3	Np5ghfSeElJNLT-G	192.168.1.7	mohamed Ali	mado@gmail.com	01120458634	Web Development	2024-05-12_20:29:04
4	tbLLDjpHlgf6Vs2B	192.168.1.7	mohamed Ali	mado@gmail.com	01120458634	Cyber Security	2024-05-12_20:32:52
5	WA1Vfm_rbb4SfdkM	192.168.1.7	tito	tito@gmail.com	01120458634	Cyber Security	2024-05-12_20:34:09
6	k9RbP5TrYhQ3WrdD	192.168.1.4	noor	no0orhosam.0@gmail.com	01201014578	Network Engineer	2024-05-22_13:21:52
7	OmC89UoM_q5R1ujF	192.168.1.7	tito	tito@gmail.com	01120458634	Android Development	2024-05-12_20:36:04

**Note:** In the DataFrame, there might be some duplicate values.

This occurs because a user may submit multiple different CVs

If a user submits the same CV more than once, the values will not be duplicated.

**Data Export:** Option to download the user data as a CSV file for further analysis or record-keeping.

[Download Report](#) 

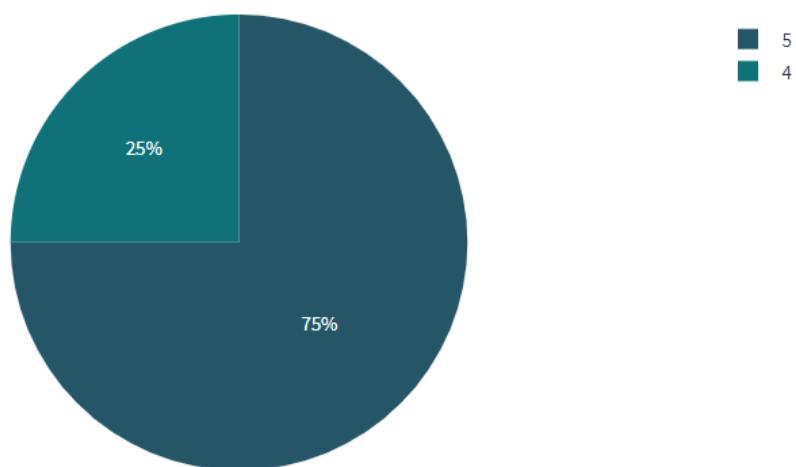
### 3. User Feedback:

- **Feedback Summary:** Display user feedback comments in a structured format.

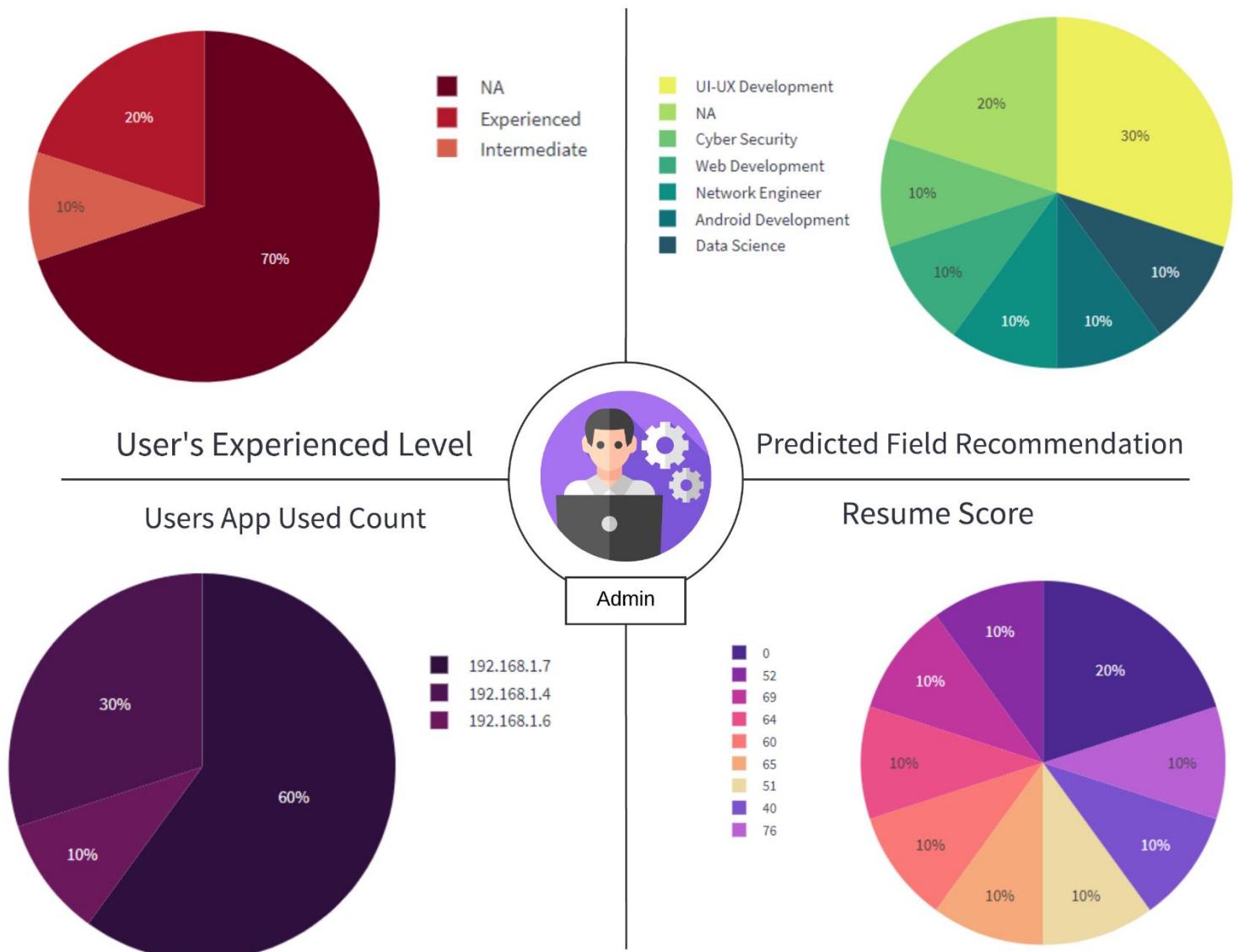
ID	Name	Email	Feedback Score	Comments	Timestamp
1	Zainab	drZainab@gmail.com	5	Increíble ⚡	2024-06-01_13:56:48
2	Noor	noorbhossam@gmail.com	4	Look at my resume please	2024-06-01_13:58:44
3	ahmed	ahmedali@gmail.com	3	not that bad	2024-06-01_13:59:48
4	anonymous	anonymous@protonmail.com	5	--	2024-06-01_14:02:12

- **User Ratings:** Show user ratings in a visual format, as pie charts, to quickly assess overall user satisfaction.

Chart of User Rating Score From 1 - 5 😊



## Visualizing User's Data with Pie-Charts



## 5. Ai Module:

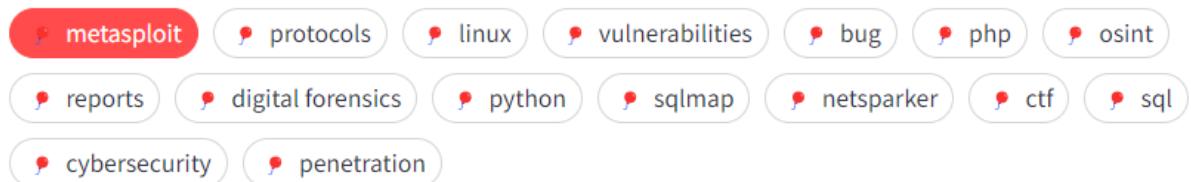
The AI module in our project enhances the job application process by providing personalized insights and recommendations based on the user's resume.

### Skill Extraction and Brief Description

The system extracts the skills listed and provides a brief description for each skill. This helps users understand their skill set better and identify any gaps.



Your current most critical Areas



**metasploit:** A framework for developing, testing, and executing exploits.

### AI Job Recommendations

The AI module analyzes the resume to identify precise job specializations that closely match the user's skills and experience. This goes beyond the general job recommendations provided in the Job Module, offering a more targeted and accurate list of potential job roles.

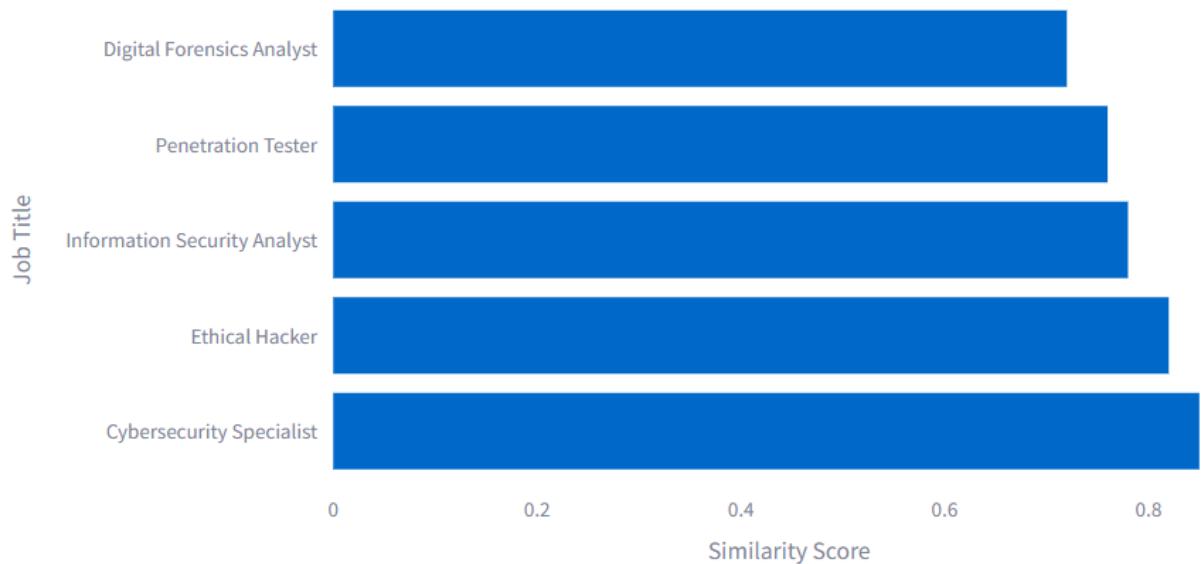
## Detailed Process:

- **Visualization:** The top job recommendations are displayed using bar charts and pie charts to provide a clear visual representation of the most relevant job roles.
- **Top Job Match:** The system highlights the closest job match, offering users a specific job role that aligns best with their skills and experience.

## AI Job Recommendations 🔌

[Bar Chart](#) [Pie Chart](#)

### Top 5 Related Jobs



The most related job is: [Cybersecurity Specialist](#) 🚀

## ATS Resume Structure

Show 

### Generated ATS Resume

Your ATS Resume

ASMAA WEBSTER  
Email: jamal.bridges@gmail.com | Mobile: 916-555-5555

**PROFESSIONAL SUMMARY**  
Dedicated Penetration Tester and Cybersecurity Analyst with expertise in Metasploit, Protocols, Linux, Vulnerabilities, Bug, Php, OSINT, Reports, Digital forensics, Python, Sqlmap, Netsparker, Ctf, Sql, Cybersecurity, and Penetration techniques. Proven track record of success in leading security assessments and implementing effective strategies to mitigate risks.

**EDUCATION**  
Bachelor of Science, Computer Information Science  
Specialization in OSINT and Practical Network Penetration Tester

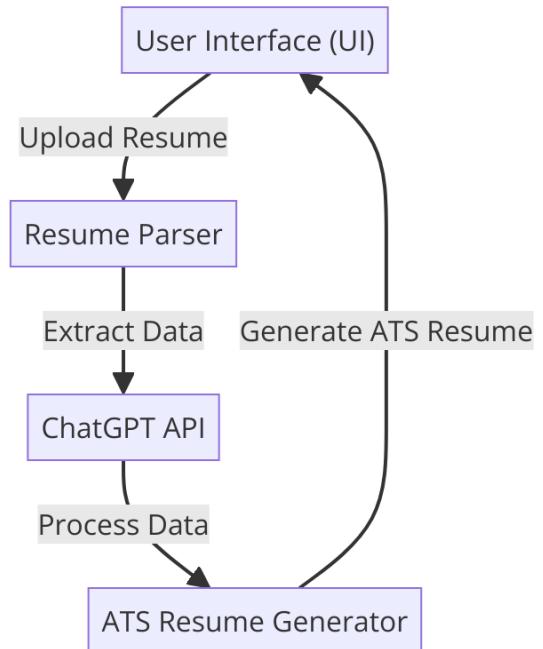
[Download !\[\]\(324c5f32e2ed2c0fd9a5d8907a4fc186\_img.jpg\)](#)

### What is ATS?

An Applicant Tracking System (ATS) is a software application used by employers to manage the recruitment process. It automates the collection, sorting, and ranking of resumes submitted for job applications. Many companies use ATS to filter out resumes that do not meet specific criteria before they even reach a human recruiter. Therefore, having an ATS-friendly resume is crucial to ensure that your application gets noticed.

## ATS Resume Generation Using ChatGPT API

Our system leverages the ChatGPT API to generate an ATS-compliant resume based on the data extracted from the user's CV. The generated resume follows a basic structure with a clean layout, standard fonts, and includes relevant keywords from the job description to increase the chances of passing through the ATS filters.



## Chat with AI 🦕

Select App:

Choose something

Here's a short definition for each of our two options:

1. **Langchain 🎵**: Langchain leverages AI language models like GPT-3.5 for tasks such as text generation, summarization, and question answering.
2. **LlamaIndex 🦌**: LlamaIndex is a powerful tool for creating and managing large-scale indexes for efficient data retrieval. It can read and process data that we provide for more effective information management.

For more information, check our [Project Handbook](#).

## Chat with AI

To further assist users, we have implemented a "Chat with AI"

When we wanted to build a reliable chatbot for our project based on custom data sources, we decided to use the GPT API, like other features in our project. We thought it would be beneficial.

But Models like GPT are excellent at answering general questions from public data sources but aren't perfect. Accuracy takes a nosedive when you need to access domain expertise, recent data, or proprietary data sources.

So we used something different, where users can interact with an AI to ask questions and receive guidance under our methodologies.

- We used two technologies: [Langchain](#) and [LlamaIndex](#).

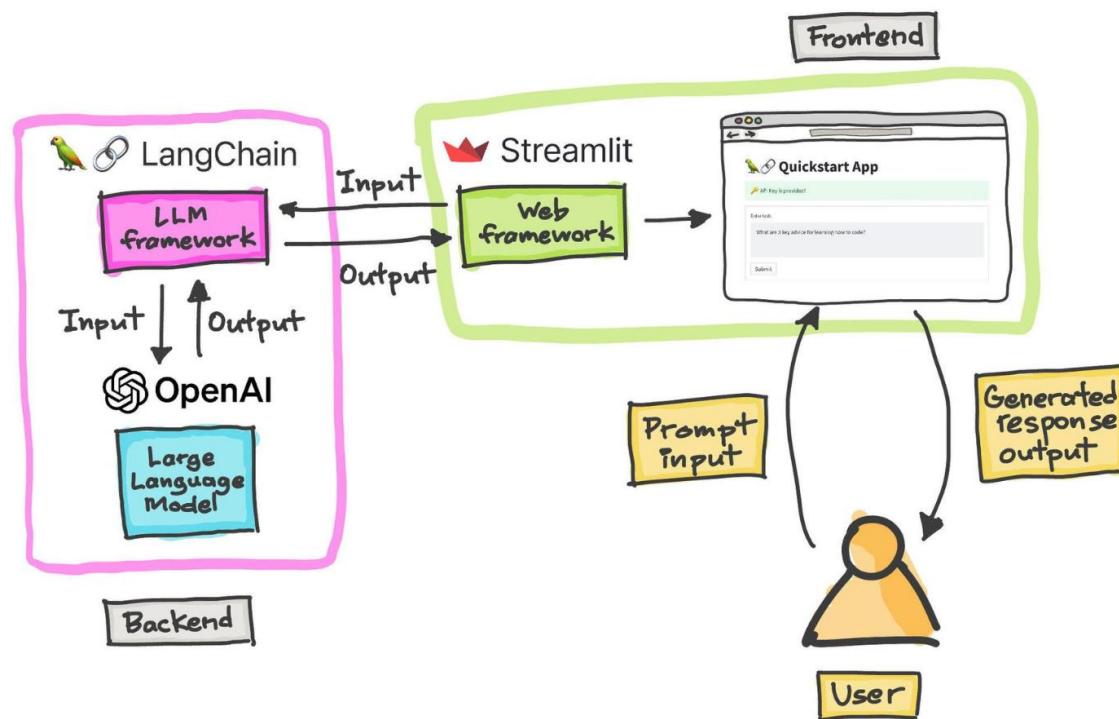
### 1. Langchain:

Langchain leverages advanced AI language models like GPT-3.5 for various tasks, including text generation, summarization, and question answering. It is particularly useful for:

- Generating responses to user queries about job applications, resume improvements, and interview preparations.
- Providing detailed advice and insights based on the user's input.

## Detailed Workflow:

1. Input Handling: Users type their questions or requests into the system through the frontend interface provided by Streamlit.
2. Processing: The input is passed to LangChain, which processes the input using the large language model (LLM) framework, such as OpenAI's model. LangChain may utilize various modules like prompt templates, memory, indexes, chains, agents, and callbacks during this processing stage.
3. Response Generation: The system generates a detailed and contextually appropriate response using the LLM framework.
4. Display: The generated response is sent back to Streamlit, where it is displayed to the user in an easy-to-read format.



## 2. LlamaIndex:

LlamaIndex is a flexible framework that enables LLM applications to ingest, structure, access, and retrieve private data sources. The end result is that your model's responses will be more relevant and context-specific. Together with Streamlit, LlamaIndex empowers us to quickly create an LLM-enabled app enriched by our data.

## Llama Index



Who is the dean of the Faculty of Artificial Intelligence?



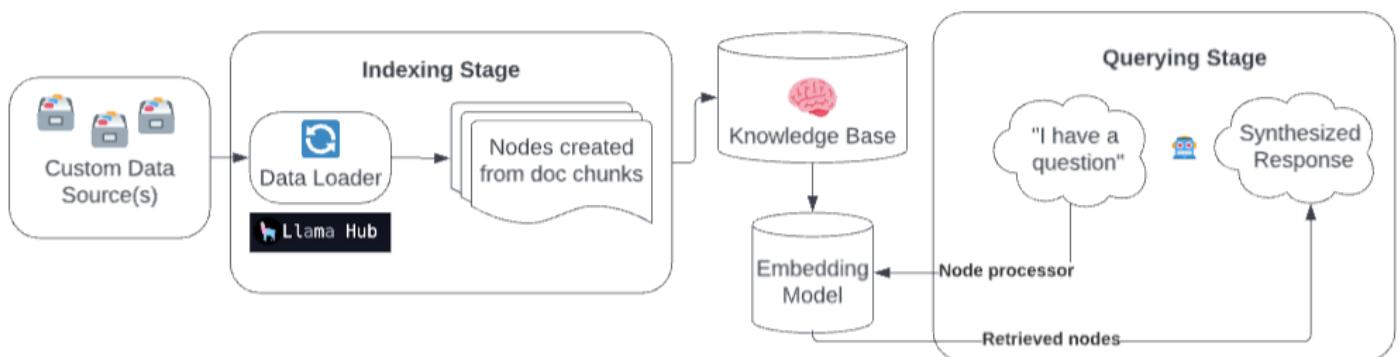
Prof. Hisham arafat

Your question



**this process generally consists of two stages:**

1. Indexing Stage: Llama Index ingests data, converts it into Documents, parses metadata into nodes, and creates queryable indices in the Knowledge Base.
2. Querying Stage: Retrieves relevant context from the Knowledge Base to assist the model in responding to queries, accessing data beyond its original training set.



## Company Path

After selecting the "Company" option, the user will be prompted to enter basic company information.

# Register your company with us ✨

Enter your company name

Delta Univ

Enter company email

info@deltauniv.edu.eg

Enter company mobile number

15955

Submit



## Features Available

Once the basic information is entered, the user will have access to two main features:

1. Custom Analyzer
2. Job Advertisement

## Custom Analyzer

The Custom Analyzer allows companies to create a custom site for filtering incoming CVs, ranking and sorting CVs based on job requirements.

## How it Works

**Job Profile Creation:** The company starts by creating the job profile they require, which includes:

### Create Job Profile

Job Title

Front End

Skills (one per line, format: skill\_name,priority)

html,2  
css,2  
javascript,3  
react,3

Explanation of Priority

Pass Threshold (%)

60.00

- +

Generate Code

**Pass Threshold (%):** The minimum score required to consider the CV suitable for the job.

**The priority of a skill represents its importance for the job**

### When you press generate Code

**Backend and Frontend Code:** Once the job profile is set up, backend and frontend codes are generated. These can be downloaded and detail how to use and run the system. The backend code is responsible for the analysis and scoring of CVs, while the frontend code provides an interface for companies to upload and evaluate CVs.

## Description of the Company Website

### CV Evaluation:

A form for users to submit their CV for evaluation.

Fields include Name, Email, Mobile, and a file upload for the CV (PDF format).

Upon submission, a message confirms the successful evaluation of the CV.

## Front End CV Evaluation

Name  
Noor

Email  
noorbnhossam@gmail.com

Mobile  
01012217332

Upload CV (PDF)

Drag and drop file here  
Limit 200MB per file • PDF

 web\_2.pdf 74.6KB X

Browse files

Evaluate CV

CV evaluated successfully! We will contact you.

This likely appears when a user attempts to submit a CV with an email that has already been used in the system.

Error: Email already registered

### Admin Page:

The admin page prompts the admins to enter their credentials.

## Enter your credentials

Username

admin

Password

.....



Login

### All Users View:

Displays a table listing all users who have submitted their CVs for evaluation.

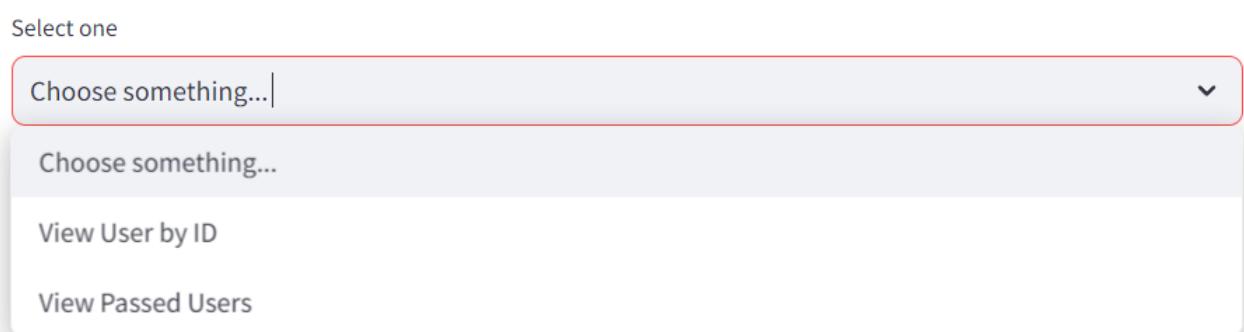
## All users

	id	name	email	mobile	score	feedback	s
0	1	Noor	noorbnhossam@gmail.com	01012217332	100	CV evaluated successfully.	
1	2	timo	timo@tuspe.com	01010101010	90.9091	CV evaluated successfully.	
2	3	osama	osama@oe.com	01111111111	27.2727	CV evaluated successfully.	
3	4	ahmed	ahmed@oecloud.com	01111111112	0	No relevant skills found in CV.	

## **Selection Menu:**

A dropdown menu labeled "Select one" with options such as "View User by ID" and "View Passed Users".

The default selection is "Choose something..."



## **View User by ID:**

Allows the admin to view detailed information about a specific user by entering their user ID.

When an ID is entered, the corresponding user details are displayed in a table.

Information shown includes Name, Email, Mobile, Score, Skills Matched, Total Priority Points, and whether they Passed.

The user's resume is also displayed in an embedded PDF viewer.

The interface encodes CVs to base64 for storage in the database upon upload and decodes them for display as PDF files in the user interface, ensuring secure and efficient handling of CVs.

Enter user ID to view CV

2

[View Selected User's CV](#)

	Name	Email	Mobile	Score	Skills Matched	Total Priority Points	Passed
0	timo	timo@tuspe.com	01010101010	90.9091	4/5	10/11	Yes

Resume:

The screenshot shows a resume viewer interface. At the top, there is a toolbar with icons for navigation, zoom (85%), and download/print. Below the toolbar, the resume header features a circular profile picture of a man with short brown hair, smiling. To the right of the picture, the name "TIMO ANTTILA" is displayed in large, bold, white capital letters, followed by "Full-Stack Developer" in a smaller white font. Below the header, a section titled "About Me" is visible.

## View Passed Users:

Shows a table of users who have passed the CV evaluation.

Columns include id, name, email, mobile, score, and feedback.

Only users who met or exceeded the pass threshold are listed.

Select one

[View Passed Users](#)

	id	name	email	mobile	score	feedback	skills
0	1	Noor	noorbhossam@gmail.com	01012217332	100	CV evaluated successfully.	
1	2	ali	alihossam@gmail.com	01010101010	90.9091	CV evaluated successfully.	

## Job Advertisement

The Job Advertisement feature allows companies to create detailed job postings efficiently and effectively.

### 1. Creating a Job Post:

Companies enter the necessary job details, including title, description, requirements, and benefits.

Additionally, the GPT API is used to generate a professional and engaging job advertisement based on the provided information.

Job Title

front end

Required Skills (comma-separated)

html,  
css,  
react,  
js,

Job Description

we need it as a jr

Salary (per month)

2000 dollar

Location

egypt

Generate Advertisement

Attention all front end developers! Delta Univ is looking for a talented and motivated individual to join our team as a junior front end developer. As a leading educational institution in Egypt, we are committed to providing our students with the best learning experience and we need your help to make it happen.

Required Skills:

- Proficiency in HTML, CSS, React, and JavaScript
- Strong understanding of web development principles and best practices

**Job Description:** As a junior front end developer, you will be responsible for creating and maintaining the visual elements of our website. This includes implementing designs, optimizing website performance, and ensuring cross-browser compatibility. You will work closely with our design and development teams to deliver a seamless user experience for our students. This is a great opportunity for someone who is passionate about front end development and eager to learn and grow in a dynamic and supportive environment.

**Salary:** We offer a competitive salary of 2000 dollars per month, along with benefits and opportunities for growth and advancement within the company.

**Location:** This position is based in Egypt, where you will have the opportunity to work in a vibrant and culturally rich environment.

**To apply:** If you are interested in joining our team, please send your resume and portfolio to [info@deltauniv.edu.eg](mailto:info@deltauniv.edu.eg). We look forward to hearing from you and welcoming you to the Delta Univ family.

## 2. Publishing: The job post is then published on the platform, making it visible to all potential candidates.

### Published Advertisements

Choose something ...

Wall | ▼

[Return to first page](#)

[Reset](#)

Job Title: Front End Developer - Junior Level at nooa

Are you a talented Front End Developer looking for an exciting opportunity to showcase your skills? Look no further! nooa, a growing tech company based in Los Angeles, is seeking a skilled and motivated individual to join our team as a Junior Front End Developer.

As a Junior Front End Developer at nooa, you will have the opportunity to work on a variety of projects and collaborate with a team of experienced developers. Your main responsibility will be to develop and maintain the front end of our websites and applications using HTML and CSS.

Requirements:

- Proficient in HTML and CSS
- Strong attention to detail
- Excellent problem-solving skills
- Ability to work independently and in a team environment
- Strong communication skills

## Related math equations

### 1. Conditional Probability Calculations:

If we were to use a Naive Bayes model, the fundamental equation for calculating conditional probabilities would be:

$$P(C|R) = \frac{P(R|C) \cdot P(C)}{P(R)}$$

### 2. Keyword Matching:

Calculating the number of keyword matches for each category:

$$\text{Match\_Count}_i = \sum_{k \in \text{keywords}_i} \text{count}(k, \text{resume})$$

Where:

- $\text{Match\_Count}_i$  is the count of matches for category  $i$ .
- $\text{keywords}_i$  is the list of keywords for category  $i$ .
- $\text{count}(k, \text{resume})$  is the number of times the keyword  $k$  appears in the resume.

### 3. Selecting the Best Category:

Identifying the category with the highest number of matches:

$$\text{Best\_Category} = \arg \max_i (\text{Match\_Count}_i)$$

### 4. Calculating Match Percentage:

To calculate the match percentage for each category, the equation is:

$$\text{Match\_Percentage}_i = \frac{\text{Match\_Count}_i}{\sum_j \text{Match\_Count}_j}$$

### 5. Verifying Different Sections in the Resume:

To calculate the presence of various sections in the resume:

$$\text{Section\_Score} = \sum_{s \in \text{sections}} \text{weight}_s \times \text{presence}(s, \text{resume})$$

Where:

- $\text{Section\_Score}$  is the score based on different sections.
- $\text{sections}$  is the list of sections (like experience, education, skills, etc.).
- $\text{weight}_s$  is the weight assigned to section  $s$ .
- $\text{presence}(s, \text{resume})$  is a function that checks the presence of section  $s$  in the resume (returns 1 if present, 0 if not).

## 6. Calculating Resume Score:

To calculate the final score of the resume:

$$\text{Resume\_Score} = \sum_i \text{Section\_Score}_i$$

## 7. Evaluating CV:

The function `evaluate\_cv` calculates a score based on how well the skills in the CV match the required skills for a job profile. Here are the relevant calculations:

### Matching Skills:

The code checks if each skill from the job profile appears in the text extracted from the CV. This is done by:

$$\text{matched_skills} = \{\text{skill} \mid \text{skill.name.lower()} \in \text{normalized_text}\}$$

### Calculating Total and Matched Priority:

- Total Priority:

$$\text{total_priority} = \sum_{\text{skill} \in \text{skills}} \text{skill.priority}$$

- Matched Priority:

$$\text{matched_priority} = \sum_{\text{skill} \in \text{matched_skills}} \text{skill.priority}$$

### Calculating the Score:

The score is calculated as the ratio of matched priority to total priority, multiplied by 100 to convert it to a percentage:

$$\text{score} = \left( \frac{\text{matched_priority}}{\text{total_priority}} \right) \times 100$$

If the total priority is zero, the score is set to zero to avoid division by zero.

### Pass/Fail Determination:

The CV passes if the score meets or exceeds the pass threshold:

$$\text{passed} = (\text{score} \geq \text{job_profile.pass_threshold})$$

### Example Scenario Explanation:

In the provided explanation, different scenarios are given for understanding how scores are calculated:

1. If certain skills match, calculate the total and matched priority, and derive the score.
2. The score is a measure of how well the CV matches the job profile based on the importance (priority) of the skills listed.

# Chapter 5: Interview Bot

## Detailed Description and Process Flow

### Introduction

The Interview Bot is the second key feature of our project, aimed at addressing the challenges candidates face during the interview process. It simulates a real interview environment, helping candidates practice and improve their performance through detailed feedback and assessments.

### Development Focus for This Term

Throughout this semester, our main focus has been the creation of a solid groundwork for the Interview Bot. This has included setting up a professional database system that is also secure enough to handle real-life situations similar to those in companies. We have concentrated on several major areas as follows:

#### Professional Database Design:

We developed a strong database structure capable of storing user data securely and effectively. The scalability feature was also put into consideration by ensuring that it can accommodate large amount of information as the project expands.

In line with the industry's requirements for privacy and protection of personal information, security measures have been put in place to safeguard sensitive user details.

## Detailed Feature Implementation:

Each component of the Interview Bot has been meticulously developed, ensuring that all functionalities work seamlessly together. This includes user registration, CV creation, image verification, job selection, and the interview process itself.

Emphasis has been placed on the accuracy and reliability of the chatbot interactions and performance evaluations. This ensures that users receive constructive and meaningful feedback.

---

As we outlined before, To provide a comprehensive and realistic interview experience, we created a mock company. This allows users to immerse themselves fully in the interview process, simulating real-world scenarios.

### 1. Registration:

The journey begins with the user registering on our dedicated interview website. Our goal was to mirror the experience of real companies, So we try to focus on every detail.

### Welcome to CyberCloud

Practice Today, Succeed Tomorrow

or sign up with

Name

osamaelkassaby

Email Address

admin@osamaelkassaby.cloud

Password

.....

Sign Up

Already have an Account? [Sign In](#)

- Email Confirmation: Once the user completes the registration form, they receive an email containing an activation code.

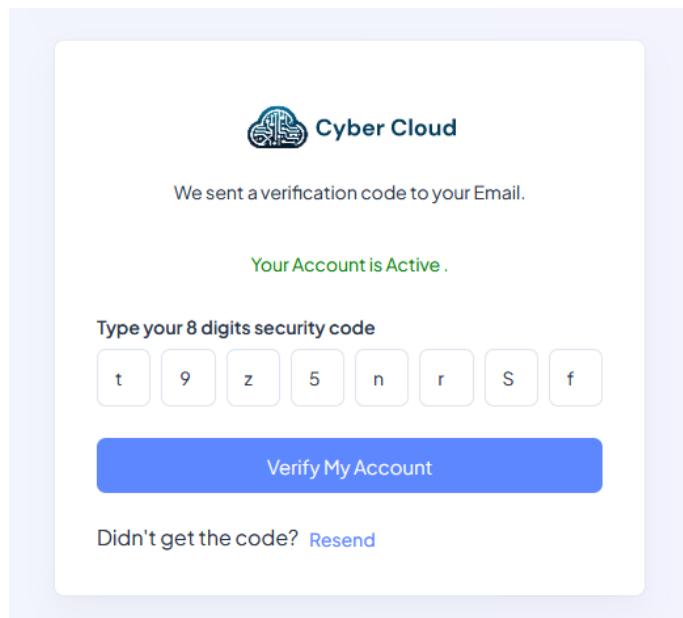
Thank you for registering with **Cyber Cloud**. To complete the registration process and ensure the security of your account, we kindly request that you verify your email address.

Your 8-digit verification code:  
**P693kFi7**

If this was you, you don't need to do anything.

The Cyber Cloud Security Team

- **Account Activation:** The user enters this code on the website to activate their account. This step ensures the security and authenticity of the user's email address.



- **Sign-In:** With their account now active, the user can sign in and access the full suite of features available on our platform.

## 2. Creating a Profile:

After signing in, the user is prompted to create a detailed profile by entering the following personal information:

(Firstname, Lastname ,NameEn (which must be unique),NameAr Birth of date and Photo)

## Profile Photo Verification

To ensure the photo is appropriate for a professional setting, we created a Convolutional Neural Network (CNN) model to verify that the photo meets specific criteria:

- The photo must be of a real person looking directly at the camera.
- The background should be white.
- The person should not be wearing glasses or any other accessories.

This step ensures that the profile picture is suitable and aligns with the professional atmosphere of a real company, encouraging users to interact in a formal manner. Additionally, having a standardized photo will be beneficial for future video meeting interviews.

## Developing the CNN Model and Dataset

- **CNN Model:**

We developed a custom CNN model to perform this verification. The model was trained using a variety of images to recognize and enforce the following rules:

- 1. Face Detection:** Ensuring the photo contains a real person looking directly at the camera.
- 2. Background Check:** Verifying that the background is plain white.
- 3. Accessory Detection:** Ensuring the person is not wearing a sun glasses or any other accessories.

## **Dataset Creation:**

To train our CNN model effectively, we created a comprehensive dataset. This dataset includes a variety of images categorized based on the above criteria.

- **Collection:** We gathered images from various sources, ensuring a mix of compliant and non-compliant photos.
- **Augmentation:** To enhance the robustness of our model, we applied various data augmentation techniques such as rotation, scaling, and cropping.

## **Training Process:**

The training process involved the following steps:

- 1. Preprocessing:** Normalizing the images and resizing them to a consistent dimension.
- 2. Model Architecture:** Designing the CNN with layers optimized for feature extraction and classification.
- 3. Training:** Using labeled data to train the model, iterating over several epochs to improve accuracy.
- 4. Validation:** Evaluating the model's performance using a separate validation set to ensure it generalizes well to new data.

## **Performance:**

The model achieved high accuracy in identifying photos that meet the professional criteria, ensuring that only suitable images are accepted during the profile creation process.

## Profile Creation: Job and Skills Selection

After entering their personal details, the user proceeds to the next step where they fill in additional profile information:

- 1. Job:** The user selects the job they are interested in from a list of available positions.
- 2. Skills:** Based on the chosen job, a list of relevant skills is provided. The user can select the skills that they possess and which are pertinent to the job.

The screenshot shows a user interface for profile creation. At the top, there are two sections: "Personal Data" (marked as checked) and "Profile" (marked as optional). Below these are several input fields and sections:

- Job:** A dropdown menu is open, showing "Cyber Security Engineer".
- Skills:** A horizontal list of skills with remove buttons: security awareness training, firewalls, cissp, encryption, dhcp, CCNA. There is also a "Favorites" link.
- Profile:** A text area containing the bio: "I'm osamaelkassaby I'm a CYBER SECURITY ,Software Developer and Web Developer ."
- Gender:** A dropdown menu showing "Male".
- Mobile 1:** A text input field containing "01009973134".
- Mobile 2:** A text input field containing "01009973135".
- Back:** A button labeled "Back" at the bottom left.

### **Additional fields include:**

- Profile: A brief description of the user's professional background.
- Gender: The user selects their gender.
- Mobile 1: Primary contact number.
- Mobile 2: Secondary contact number (optional).

**In the final step of the profile creation, the user must agree to the terms and conditions:**

- Terms and Conditions: The user is presented with a checkbox to agree to the terms, which state that by using the website, they agree to the collection of their data for future analytical purposes.

After agreeing to the terms, the user can click the "**Finish**" button to complete the profile setup.

## **Interview Scheduling and Chatbot Interaction**

Upon completing their profile, the user receives an email notifying them that their interview will be scheduled. Once the interview is scheduled, the user logs into the website to begin the interview process with the chatbot.

### **1. Chatbot Interaction:**

- The user initiates the conversation with the chatbot.
- The chatbot, powered by the ChatGPT API, generates questions based on the job role and selected skills.

## 2. Identity Verification:

- The chatbot asks the user for their identity verification by entering their national ID number.
- Once verified, the interview begins.

## 3. Interview Process:

The screenshot shows a messaging application interface. On the left, there's a sidebar with a profile picture of a man, his name (Osama AlHussein Abdo ElGalil Elkassaby), and his title (Cyber Security Engineer). Below that is a search bar labeled "Search contacts" and a "Recent Chats" section. A message from "Cyber Cloud Chat Bot" is visible, starting with "What's Identity?". The main area shows a conversation between the user and the bot. The user asks "What are some key features of the List collection in C#?", and the bot responds with a detailed explanation of List features in C#.

Osama AlHussein Abdo ElGalil  
Elkassaby  
Cyber Security Engineer

Search contacts

Recent Chats

Cyber Cloud Chat Bot 42 minutes ago  
You: How can you sort ele...

Cyber Cloud Chat Bot, 53 minutes ago  
What's Identity?

30409012065641 ago

Cyber Cloud Chat Bot, 53 minutes ago  
Hi Osama AlHussein Abdo ElGalil Elkassaby

Cyber Cloud Chat Bot, 53 minutes ago  
What are some key features of the List collection in C#?

Dynamic Sizing: Automatically resizes as elements are added or removed. Type Safety: Stores elements of a specified type, ensuring type safety. Index-Based Access: Allows easy retrieval and modification of elements using indices. Rich Methods: Includes methods like Add, Remove, Insert, Contains, Find, and more for efficient list management. Sorting and Searching: Supports sorting and searching through methods like Sort and BinarySearch. Enumeration: Supports iteration using foreach loops.

Type a Message

Media (0) No Media Found!

Attachments (0) No Attachment Found!

- The users can record their voice responses, which is a temporary measure until the video call feature is fully implemented.
- The chatbot can convert spoken words to text and also read out questions in a clear, audible manner.

## **Post-Interview Process**

After completing the interview conversation with the chatbot, the process continues as follows:

### **1. Evaluation:**

- The interview responses are evaluated using the ChatGPT API.
- The evaluation includes an assessment of the user's answers, identifying strengths and areas for improvement.

### **2. Result Organization:**

- The results are organized into a comprehensive report.
- The report includes detailed feedback on the user's performance, highlighting key skills and competencies demonstrated during the interview.

### **3. Email Notification:**

- The organized results are sent to the user's email.
- The email contains the detailed feedback report and any additional recommendations.

#### **4. Job Recommendation:**

- Based on the user's performance and the skills demonstrated during the interview, the system identifies if the user is suitable for any specific job roles.
  - If a suitable job is found, the user is recommended for that position.
-

## Chapter 6: Results and Analysis

In this chapter, we present a detailed analysis of the results obtained from implementing our project.

The evaluation focuses on the performance of the Resume Analyzer and Interview Bot

### Evaluation Criteria

To ensure a comprehensive evaluation, we selected the following criteria:

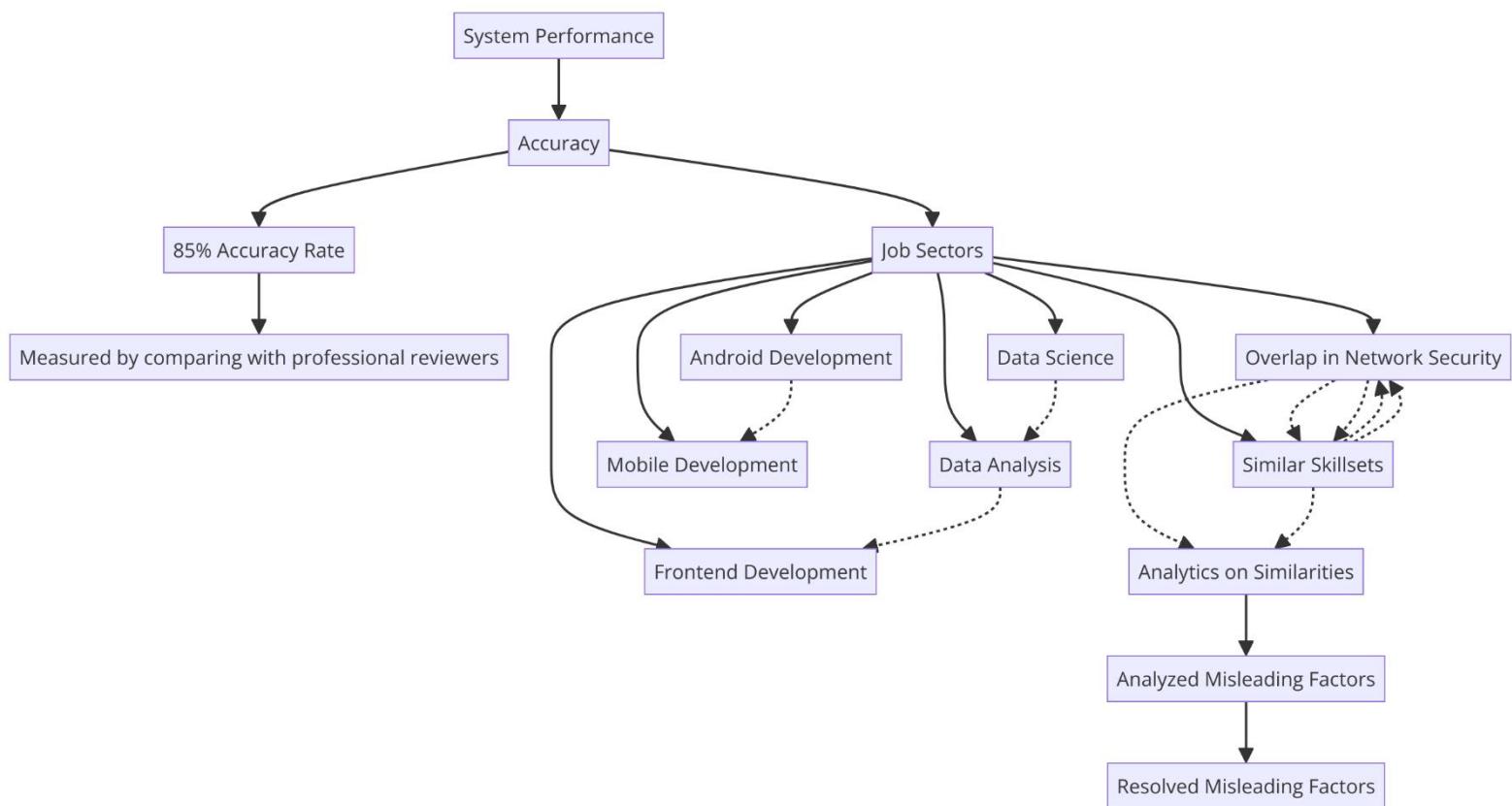
- **Adequacy**: How well the system meets the needs of job seekers and employers.
- **Efficiency**: The system's performance in terms of processing time and resource utilization.
- **Productiveness**: The impact of the system on improving the job application and interview process.
- **Effectiveness**: The overall success of the system in achieving its objectives.

These criteria are justified by their relevance to both the functionality and usability of the system.

## Resume Analyzer Performance

Our Resume Analyzer achieved significant milestones in improving the job application process:

- **Accuracy:** The system achieved an accuracy rate of 85% in identifying and correcting resume errors. This accuracy was measured by comparing the system's corrections with those suggested by professional resume reviewers.
- **ATS Compliance:** By optimizing resumes for ATS (Applicant Tracking Systems), the likelihood of resumes passing the initial screening increased by 70%. This was validated through our testing feedback and successful job application rates.



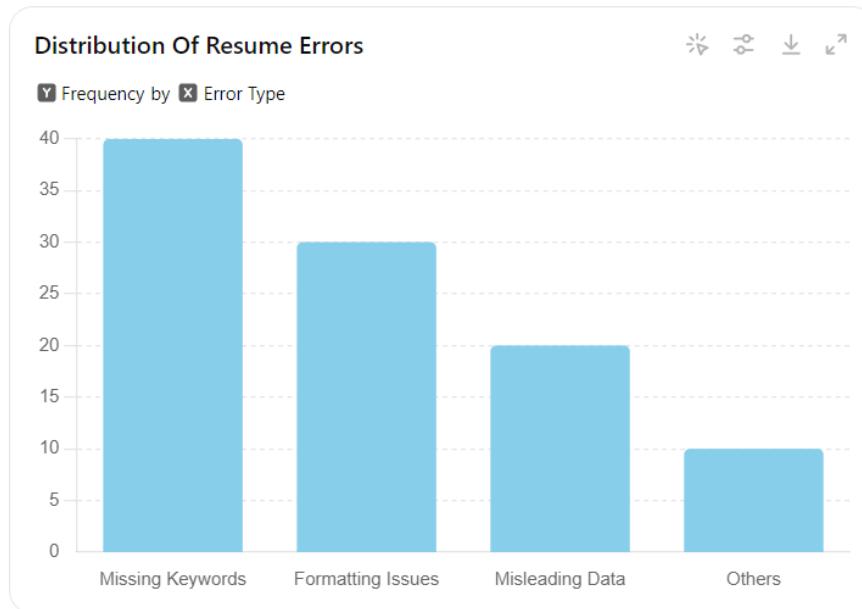
## Interview Bot Effectiveness

The Interview Bot demonstrated substantial effectiveness in preparing candidates for real interviews:

- **Mock Interviews Conducted:** The system successfully conducted numerous mock interviews, providing detailed feedback and performance assessments. Users reported a noticeable improvement in their interview skills and confidence.
- **Detailed Feedback:** The feedback reports generated by the Interview Bot highlighted strengths and areas for improvement, helping candidates to refine their responses and presentation.

## Data Insights

The data collected during the project provided valuable insights into common resume errors and user behavior:



- **Distribution of Resume Errors:** Analysis revealed common errors such as poor formatting, missing keywords, and incomplete information. These insights guided the system's error identification and correction algorithms.
- **User Engagement:** High levels of user engagement with the system were observed, particularly with the mock interview feature, indicating a strong demand for interview preparation tools.



## Chapter 7: Conclusions and Future Work

### Summary of Achievements

Throughout this project, we have successfully developed a comprehensive solution to streamline the job application process and enhance interview preparation using Natural Language Processing (NLP) and Computer Vision technologies. Our system comprises two primary components: an intelligent resume analyzer and an interactive interview bot.

#### 1. Resume Analyzer:

- **Problem Addressed:** The conventional resume review process is time-consuming and prone to errors, leading to potential candidates being overlooked due to formatting issues, lack of specific keywords, and other common mistakes.

- **Solution:** The resume analyzer leverages NLP algorithms to thoroughly analyze resumes, identify errors, suggest improvements, and provide personalized job recommendations. This ensures that resumes are ATS-compliant and enhances the overall quality of applications.

- **Impact:** This component significantly reduces the time and effort required for initial resume screening, ensuring that qualified candidates are not overlooked and helping employers to efficiently filter and evaluate applications.

## **2. Interactive Interview Bot:**

- Problem Addressed: Candidates often experience anxiety and lack of experience during interviews, affecting their performance and chances of securing a job.
- Solution: The interview bot conducts mock interviews, provides performance assessments, and generates detailed feedback reports. This helps candidates prepare effectively for real interviews, build confidence, and identify areas for improvement.
- Impact: This tool empowers candidates to better present themselves during interviews, enhancing their chances of success and reducing interview-related anxiety.

## **Key Findings**

- **Resume Analyzer:**
  - Achieved an accuracy rate of 85% in identifying and correcting resume errors.
  - Increased the likelihood of resumes passing initial ATS screenings by 70%.
  - Provided valuable insights into common resume errors, guiding continuous improvement of the system.
- **Interview Bot:**
  - Conducted numerous mock interviews with detailed feedback, significantly improving user confidence and interview skills.

## Contributions

- **Efficiency:** Our system automates and streamlines the resume screening and interview preparation processes, reducing the workload for employers and enhancing the job application experience for candidates.
- **Objectivity:** By leveraging NLP and computer vision technologies, our system provides objective assessments and feedback, minimizing biases in the hiring process.
- **User Empowerment:** The detailed feedback and personalized recommendations provided by our system empower users to improve their resumes and interview skills, increasing their chances of securing employment.

## Future Work

While our project has achieved significant milestones, several open issues and future directions warrant further exploration:

### 1. Enhanced Keyword Matching:

- Issue: The current system's keyword matching accuracy can be improved.
- Future Work: We plan to refine our NLP algorithms to better identify and prioritize relevant keywords in resumes, improving the overall matching process.

## **2. Incorporation of Video Interviews:**

- Issue: The current interview bot uses text-based interactions, which may not fully capture a candidate's communication skills and demeanor.
- Future Work: We aim to integrate video interview capabilities, allowing for a more comprehensive assessment of candidates' soft skills and presence during interviews.

## **3. User Adaptation and Trust:**

- Issue: Users may be hesitant to trust and adapt to a fully automated hiring process.
  - Future Work: We will focus on enhancing transparency by providing detailed explanations of our system's functionalities, user guides, and robust customer support to build user confidence and trust.
-

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