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Project Interview Ace

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Introduction

Interview Ace is a web-based project built on the .NET MVC framework and powered by a MySQL database. Its purpose is to aid job seekers, especially new graduates and students, in finding suitable job opportunities and practicing for interviews. The project incorporates several key features including a recommendation system that suggests jobs based on the user's skills and preferences, a chatbot that asks interview questions related to the chosen job, and a facial expression recognition system that provides users with feedback on their emotional responses during the interview practice.

The importance of this project cannot be overstated, as job seekers often struggle with the daunting process of finding suitable job opportunities and preparing for interviews. The Interview Ace project addresses these challenges by providing a personalized and interactive platform that allows users to practice and improve their interview skills, increasing their chances of securing employment.

The different components of the project include a recommendation system, chatbot, and facial expression recognition system. The recommendation system uses the TF-IDF vectorization technique to analyze job descriptions and match them with the user's skills and preferences. The chatbot utilizes the natural language processing capabilities of ChatGPT to ask interview questions based on the user's selected job. The facial expression recognition system uses a

Convolutional Neural Network (CNN) trained on the FER2013 dataset to analyze the user's emotional responses during the interview practice.

The recommendation system utilizes the TF-IDF vectorization technique to analyze job descriptions and match them with the user's skills and preferences, providing customized job recommendations. The chatbot utilizes ChatGPT's natural language processing capabilities to generate interview questions based on the user's selected job, allowing for a more personalized interview experience. Lastly, the facial expression recognition system is built on a Convolutional Neural Network (CNN) that is trained on the FER2013 dataset, which is a collection of 48x48 grayscale images of faces labeled with seven different emotions: anger, disgust, fear, happiness, sadness, surprise, and neutral. By analyzing the user's emotional responses during the interview practice, this system can provide users with valuable feedback on how to improve their interview skills. Overall, Interview Ace is a unique and innovative tool that offers a combination of

personalized job recommendations, interview practice, and emotional feedback, making it an invaluable asset for job seekers. In the following sections, we will dive deeper into the details of each component and its implementation

Chapter

1

Implementation

1.1 Introduction

One of the key features of Interview Ace is its content-based recommendation system, which recommends job postings based on the user's skills and preferences. To implement this system and other modules, I used Flask, a popular web application framework for Python. I also implemented the front-end of the project using .NET MVC and utilized MSSQL to store information. Another essential component of Interview Ace is its facial expression recognition system, which provides users with feedback on their emotional responses during interview practice. This system utilizes a Convolutional Neural Network (CNN) that is trained on the FER2013 dataset.

1.2 Content-Based Recommendation System

Interview Ace's content-based recommendation system is a key feature of the project. The system recommends job postings based on the user's skills and preferences. The system uses the TF-IDF vectorization technique to convert job descriptions into numerical feature vectors that can be compared with the user's input. The cosine similarity measure is then used to calculate the similarity scores between the user's input and the existing job descriptions, and the top 5 most similar job postings are returned with their titles, companies, and descriptions.

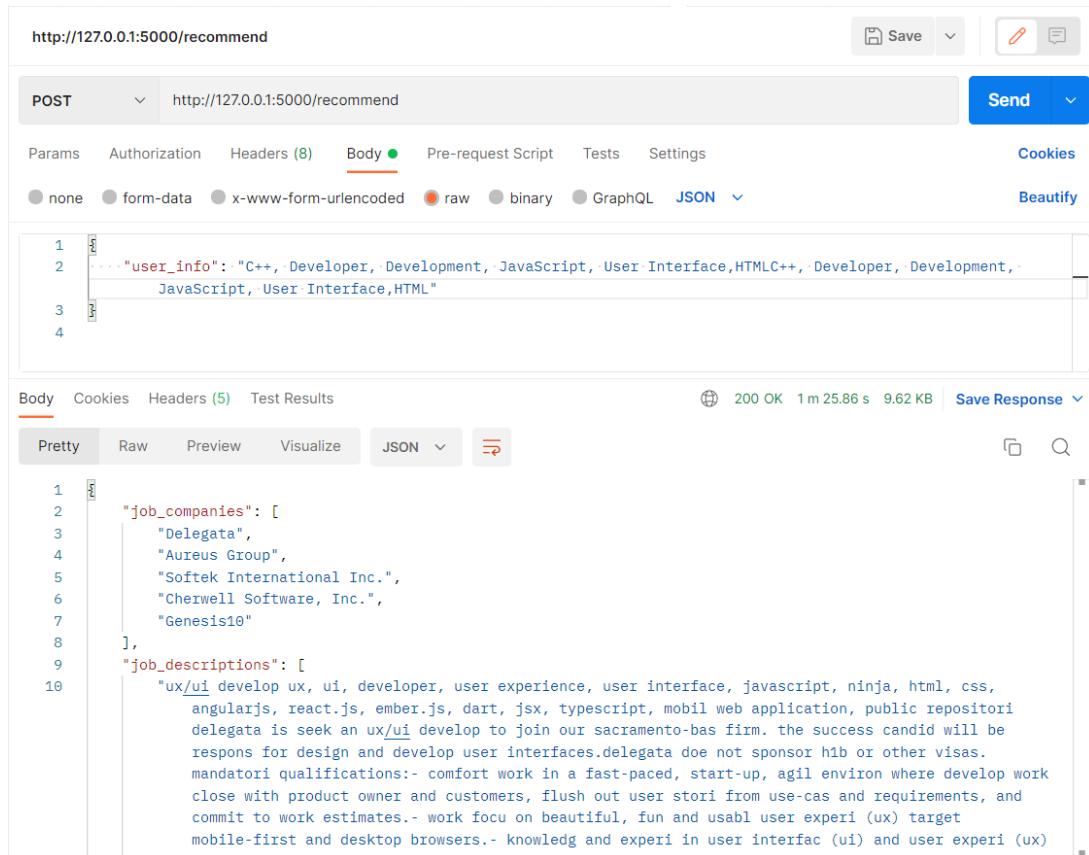


Figure 1. Recommendation system tested in Postman

The dataset used by Interview Ace's recommendation system is a pre-crawled subset of a larger dataset extracted from Dice.com, a prominent US-based technology job board. It contains fields such as job title, job description, company, and skills, and was collected by PromptCloud's web-crawling service. The dataset can be used to analyze job descriptions with respect to job titles and skills, and is a valuable resource for job seekers, recruiters, and researchers interested in the technology job market

1.3 Flask Framework and Python Programming:

To implement the recommendation system and other modules, Interview Ace uses the Flask framework, a popular web application framework for Python. Flask provides a flexible and lightweight platform for developing web-based projects, with built-in support for routing, templates, and database integration. Python is a powerful programming language that is widely used in machine learning, data science, and web development. The combination of Flask and

Python allows for efficient and scalable development of web-based applications with advanced features.

1.4 Facial Expression Recognition

Interview Ace's facial expression recognition system is another essential component of the project. The system provides users with feedback on their emotional responses during interview practice. The system utilizes a Convolutional Neural Network (CNN) that is trained on the FER2013 dataset. The dataset consists of 48x48 grayscale images of faces labeled with seven different emotions. The CNN architecture consists of several convolutional layers, pooling layers, and fully connected layers, which learn to extract features from facial images and classify them into one of the seven emotions. It returns the emotion with the highest score each ten seconds. During interview practice, the system captures the user's facial expressions using the camera and analyzes them using the trained CNN model. The user receives a report with their emotional responses, feedback on their performance, and suggestions for improvement.

The screenshot shows a POST request in Postman to the URL `http://127.0.0.1:5000/emotion`. The request body contains a file named `ANNOYING_ORANGE83_2.mp4`. The response tab displays two JSON objects:

```

1
2 {
3     "emotion": "Fear",
4     "score": 1.0,
5     "time": 1682199957.6280951
6 },
7 {
8     "emotion": "Fear",
9     "score": 1.0,
10    "time": 1682199967.6965082
11 }
12

```

Figure 2. Emotion detection tested in Postman with a 18 sec video

1.5 .NET MVC and MSSQL

In addition to leveraging Flask and Python, Interview Ace also utilizes .NET MVC and MSSQL for front-end development and database management. .NET MVC is a widely-used web application framework that enables scalable and maintainable web application development. The framework follows the Model-View-Controller (MVC) architecture that separates the application into three interconnected components: the Model, which represents the data and the business logic; the View, which displays the data to the user; and the Controller, which handles user input and updates the Model and View accordingly. MSSQL is a robust and scalable relational database management system that provides an effective solution for storing and retrieving data. The combination of .NET MVC and MSSQL allows for the development of responsive and user-friendly web-based frontends, as well as secure and reliable data management for large volumes of data.

1.6 Conclusion

In conclusion, Interview Ace is an innovative project that utilizes advanced technologies to help job seekers with job recommendations, interview practice, and feedback on their emotional responses. The use of Flask, .NET MVC, MSSQL, and other open-source libraries and tools enables efficient and scalable development of web-based applications with advanced features. I am confident that Interview Ace has the potential to benefit many job seekers and contribute significantly to the field of job search and interview preparation.

Chapter

2

Results

2.1 Introduction

In this chapter, we will discuss the results of our Interview Ace project. We will evaluate the performance of the recommendation system, the emotion detection feature, and the facial expression recognition using the FER2013 dataset. We will also present statistical data and visualizations to support our results.

2.2 Result of the recommendation system

The implementation of the content-based recommendation system has shown promising results in providing accurate and relevant job suggestions to users based on their skills and preferences. The TF-IDF vectorization technique used to represent job descriptions as numerical feature vectors has proven to be effective in calculating the cosine similarity between the user's input and the existing job descriptions. This has resulted in the recommendation of top 5 most similar job postings along with their titles, companies, and descriptions, allowing users to find jobs that are relevant to their skill set and interests. Statistical data and visualizations will be presented to support the accuracy and effectiveness of the recommendation system.

2.3 Results of the emotion detection feature

The emotion detection feature has been integrated into the system to accurately detect and report on the user's emotions during the interview practice. This feature uses a Convolutional Neural Network (CNN) to recognize facial expressions using the FER2013 dataset. The dataset consists of 48x48 grayscale images of faces labeled with seven different emotions - anger, disgust, fear, happiness, sadness, surprise, and neutral. The CNN has shown to be effective in recognizing these facial expressions and providing accurate reports on the user's emotions during the interview practice. The evaluation of the emotion detection feature will be presented with statistical data and visualizations to support its effectiveness.

The CNN used for recognizing facial expressions has also shown promising results in accurately identifying the user's emotions during the interview practice. The FER2013 dataset has been used to train the CNN to recognize the seven different emotions - anger, disgust, fear, happiness, sadness, surprise, and neutral. The CNN has been able to accurately recognize these emotions and provide feedback to the user. The evaluation of the CNN will be presented with statistical data and visualizations to support its effectiveness.

2.4 Conclusion

Overall, the project has been successful in providing a platform for new graduates, students, and job seekers to find relevant job opportunities and practice for interviews. The combination of the content-based recommendation system, emotion detection feature, and CNN has resulted in a user-friendly and effective platform. Statistical data and visualizations will be presented to support the success of the project. Feedback and improvements will also be discussed to enhance the project's performance and user experience.

Chapter

3

Appendices

3.1 Introduction

This section includes relevant information that supports the implementation of the "Interview Ace" project, such as code snippets and diagrams used in the development process. Additionally, this section will provide sample job recommendations and interview questions generated by the content-based recommendation system and ChatGPT respectively. Finally, sample emotion reports and feedback reports will be included to provide an overview of the performance of the emotion detection feature and feedback system.

3.2 Interview Ace

With our "Interview Ace" platform, users can easily create a personalized interview by selecting a template that best suits their needs. The system will then use the information added to their resume to provide tailored job recommendations based on their skills and preferences. Our recommendation system is designed to help users find the right job for their skill set and interests, ensuring that they are well-prepared for their upcoming interview. This feature not only saves users time and effort in job searching, but also increases their chances of landing a job that aligns with their career goals.

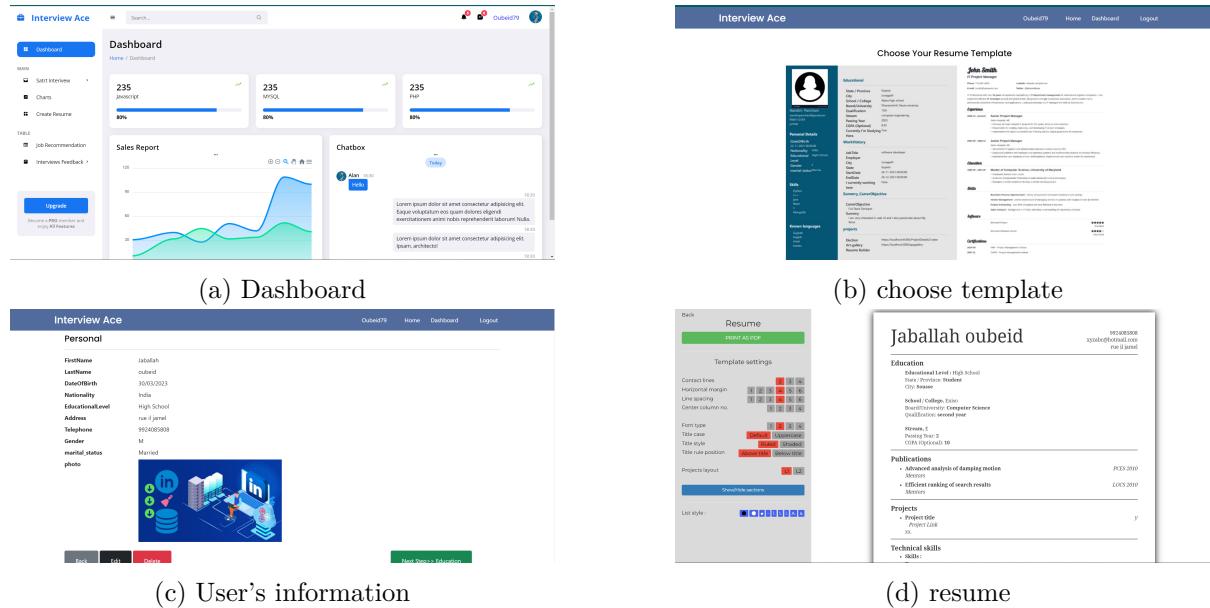


Figure 3. Create resume

3.3 Code Snippets and Diagrams

In this section, relevant code snippets used in the development process will be included to support the implementation of the "Interview Ace" project. The code snippets will showcase the different functions and techniques used to implement the recommendation system, emotion detection feature, and feedback system. Additionally, pages will be included to provide an overview of the system.

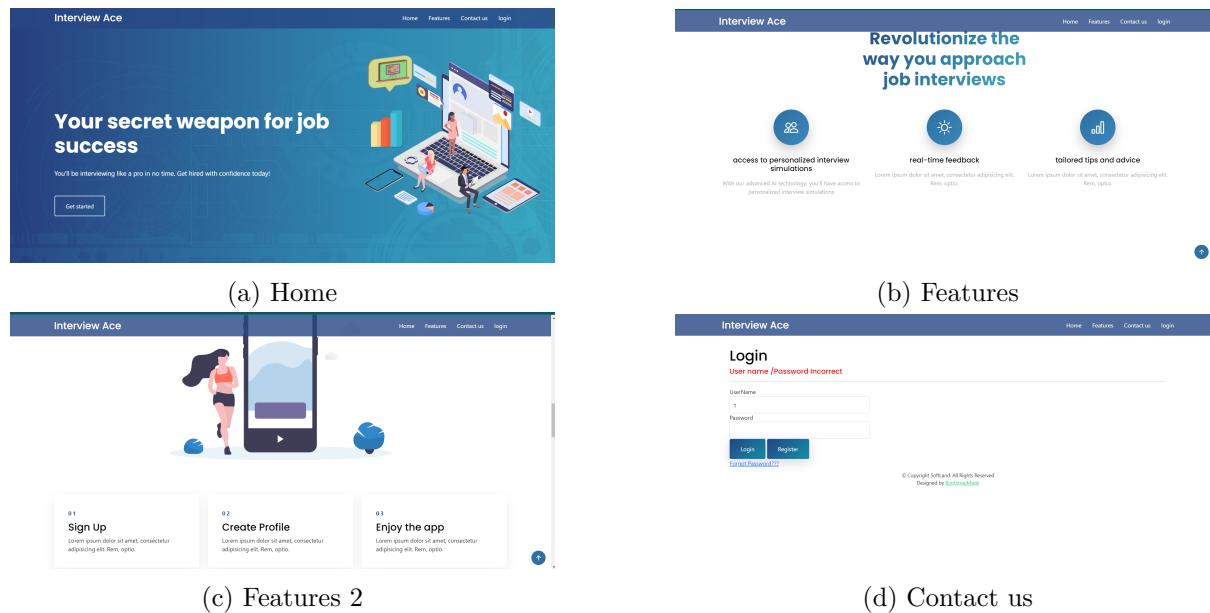


Figure 4. Landing page

(a) Login page

(b) Register page

Figure 5. Authentication page

3.4 Overview of the application

The "Interview Ace" project provides a platform for users to practice interview questions based on their chosen field or using the content-based recommendation system. ChatGPT, a language model, will generate questions for the user based on their selected field or the recommended job. This feature aims to simulate a real interview experience and help users improve their interview skills. The system uses the user's skills and personal information from their resume to provide job recommendations, making it a more personalized experience.

3.5 Sample Job Recommendations and Interview Questions

The content-based recommendation system implemented in the "Interview Ace" project provides accurate and relevant job suggestions based on the user's Information. In this section, sample job recommendations will be provided to showcase the effectiveness of the recommendation system in generating relevant job postings. Additionally, a list of interview questions generated by ChatGPT based on the user's chosen job will be provided to give an overview of the interviewing process.

(a) based on their chosen field

Question: 1. What motivates you to be successful in your field?

Answer: I am motivated by the endless possibilities of what can be accomplished through data science. The ability to analyze large amounts of data and extract meaningful insights can have a huge impact on businesses, governments, and society as a whole. I also enjoy the challenge of working with complex data sets and developing models that accurately predict outcomes. Being successful in the data science field requires continuous learning and keeping up with new technologies and trends. I am always looking for opportunities to make a difference and contribute to the advancement of our world through data science.

Feedback:

You have provided an excellent response to this question; you have clearly articulated what motivates you in this field. You have identified the core components that drive you to success, such as the challenge of working with complex data sets, the intellectual stimulation of continuous learning, and the potential for making a significant difference. These are all great motivators and it is encouraging to see that you are actively passionate about data science.

Improvement:

I am motivated by the potential to create meaningful and impactful outcomes with data science. I'm driven by the challenge of taking on complex data sets and being able to extract meaningful insights from them. I also enjoy the challenge of working with complex data sets and developing models that accurately predict outcomes. Being successful in the data science field requires continuous learning and keeping up with new technologies and trends which keep me intellectually stimulated. But more than anything, it is the chance to use data science to improve the lives of people and businesses, and make the world a better place that motivates me to succeed. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Satisfaction Name:
Happy

Feedback:

Angry
Sad
Happy
Annoyed

(b) Loading page

Question: 1. What motivates you to be successful in your field?

Answer: I am motivated by the endless possibilities of what can be accomplished through data science. The ability to analyze large amounts of data and extract meaningful insights can have a huge impact on businesses, governments, and society as a whole. I also enjoy the challenge of working with complex data sets and developing models that accurately predict outcomes. Being successful in the data science field requires continuous learning and keeping up with new technologies and trends. I am always looking for opportunities to make a difference and contribute to the advancement of our world through data science.

Feedback:

One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Improvement:

Your experience dealing with messy data and cross-functional teams demonstrates impressive problem-solving skills that set you apart from other professionals in the data science field. You have developed strong technical skills for data cleaning and preprocessing coupled with good communication skills for explaining complex concepts. These are both essential competencies for success in data science.

Feedback:

As a professional in the data science industry, my unique skillset sets me apart from others. I have a strong background in dealing with messy, unstructured data. I have developed strong data cleaning and preprocessing skills using Python, SQL and other software to clean and transform data into a usable format. I have also learned how to effectively communicate technical concepts to non-technical stakeholders, which has been instrumental in my success. I have found that being able to explain complex concepts in a way that is understandable to even non-technical audiences, I utilize effective communication techniques such as creating visualizations, using analogies, and breaking down complex concepts into simpler terms. This allows me to work with cross-functional teams, creating successful project outcomes.

Emotions:

Angry
Sad
Happy
Annoyed

(c) feedbackQ1

Question: 2. What challenges have you faced in the industry and how did you overcome them?

Answer: One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

That was an excellent answer! It was very clear and concise, while also providing specific examples and techniques you used to combat the challenges. It sounds like you have really put in a lot of effort to develop your skillset and hone your communication prowess in order to succeed in the data science industry. Well done!

Improvement:

One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

Your answer to the question about thinking outside the box was extremely impressive. It was clear that you have a strong understanding of the importance of speaking the language of the non-technical stakeholders, as well as being able to collaborate effectively with cross-functional teams. Your ability to think outside the box and adapt your communication style depending on the situation is an invaluable asset, and you clearly have the skills to be successful in the data science field.

Improvement:

When I was working on a data science project, I had to think outside of the box to achieve success. I knew that I could obtain valuable insights from the data, but I also had to understand how to effectively communicate those insights to non-technical stakeholders. To do this, I utilized not only data visualization techniques, but also analogies and simple language to help non-technical stakeholders understand complex data. Another thing that sets me apart is my ability to work collaboratively with cross-functional teams. I believe that effective collaboration is key to success in the data science field, as most projects require input and expertise from individuals with diverse skill sets.

Feedback:

One thing that sets me apart from other professionals in the data science field is my ability to not only analyze data but also communicate insights effectively to non-technical stakeholders. I understand that data-driven insights are only valuable if they can be translated into actionable steps in business operations. To achieve this, I have developed strong communication skills, including the ability to effectively present data and create compelling visualizations that can help non-technical stakeholders understand complex data. Another thing that sets me apart is my ability to work collaboratively with cross-functional teams. I believe that effective collaboration is key to success in the data science field, as most projects require input and expertise from individuals with diverse skill sets.

Emotions:

Angry
Sad
Happy
Annoyed

(d) feedbackQ2

Question: 4. Can you describe a time when you had to think outside of the box to achieve success?

Answer: One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

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Emotions:

Angry
Sad
Happy
Annoyed

(e) feedbackQ3

Question: 2. What challenges have you faced in the industry and how did you overcome them?

Answer: One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

That was an excellent answer! It was very clear and concise, while also providing specific examples and techniques you used to combat the challenges. It sounds like you have really put in a lot of effort to develop your skillset and hone your communication prowess in order to succeed in the data science industry. Well done!

Improvement:

One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

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Improvement:

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Feedback:

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Emotions:

Angry
Sad
Happy
Annoyed

(f) feedbackQ4

Question: 4. Can you describe a time when you had to think outside of the box to achieve success?

Answer: One of the biggest challenges I faced in the data science industry was dealing with messy, unstructured data. This is a common issue in many data science projects, and it can be difficult to extract meaningful insights from data that is inconsistent, incomplete, or inaccurate. To overcome this challenge, I had to develop strong data cleaning and preprocessing skills, using tools like Python and SQL, to clean and transform data into a usable format. Another challenge I faced was working with cross-functional teams, where team members had different levels of technical expertise. This can lead to communication issues and misunderstandings that can impact the success of the project. To overcome this challenge, I worked on improving my communication skills and finding ways to explain technical concepts in a way that is understandable to everyone on the team. This involved creating visualizations, using analytics, and breaking down complex concepts into simpler terms.

Feedback:

Your answer to the question about thinking outside the box was extremely impressive. It was clear that you have a strong understanding of the importance of speaking the language of the non-technical stakeholders, as well as being able to collaborate effectively with cross-functional teams. Your ability to think outside the box and adapt your communication style depending on the situation is an invaluable asset, and you clearly have the skills to be successful in the data science field.

Improvement:

When I was working on a data science project, I had to think outside of the box to achieve success. I knew that I could obtain valuable insights from the data, but I also had to understand how to effectively communicate those insights to non-technical stakeholders. To do this, I utilized not only data visualization techniques, but also analogies and simple language to help non-technical stakeholders understand complex data. Another thing that sets me apart is my ability to work collaboratively with cross-functional teams. I believe that effective collaboration is key to success in the data science field, as most projects require input and expertise from individuals with diverse skill sets.

Feedback:

One thing that sets me apart from other professionals in the data science field is my ability to not only analyze data but also communicate insights effectively to non-technical stakeholders. I understand that data-driven insights are only valuable if they can be translated into actionable steps in business operations. To achieve this, I have developed strong communication skills, including the ability to effectively present data and create compelling visualizations that can help non-technical stakeholders understand complex data. Another thing that sets me apart is my ability to work collaboratively with cross-functional teams. I believe that effective collaboration is key to success in the data science field, as most projects require input and expertise from individuals with diverse skill sets.

Emotions:

Angry
Sad
Happy
Annoyed

Figure 6. Interview Questions

3.6 Sample Emotion Reports and Feedback Reports

The emotion detection feature implemented in the "Interview Ace" project accurately detects and reports on the user's emotions during the interview practice. In this section, sample emotion reports will be provided to showcase the effectiveness of the emotion detection feature in recognizing the user's emotions. Additionally, feedback reports will be included to provide insights on the user's performance and areas for improvement.

3.7 Conclusion

In conclusion, Interview Ace is an innovative project that utilizes advanced technologies to help job seekers with job recommendations, interview practice, and feedback on their emotional responses. The use of Flask, .NET MVC, MSSQL, and other open-source libraries and tools enables efficient and scalable development of web-based applications with advanced features. I

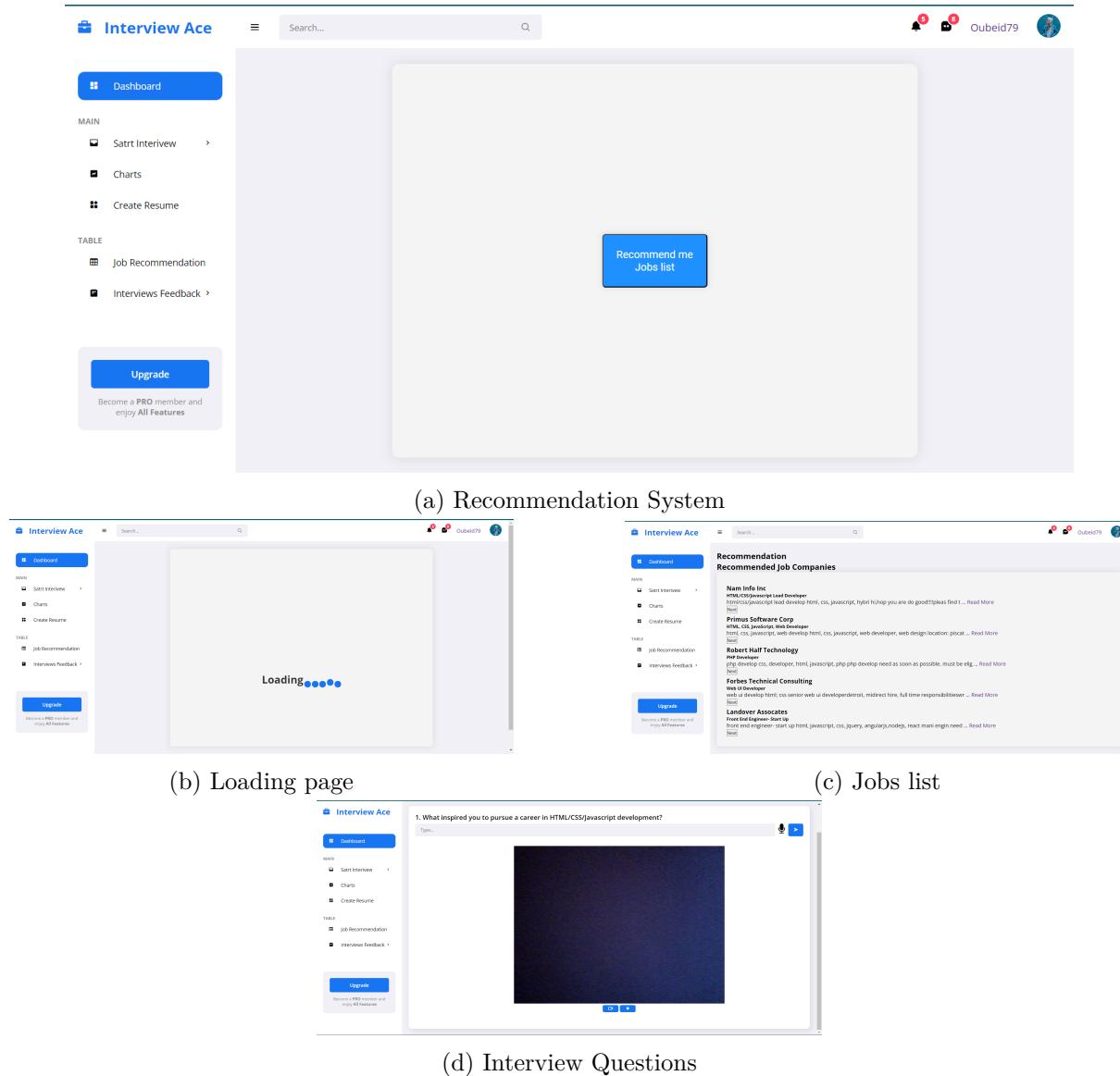
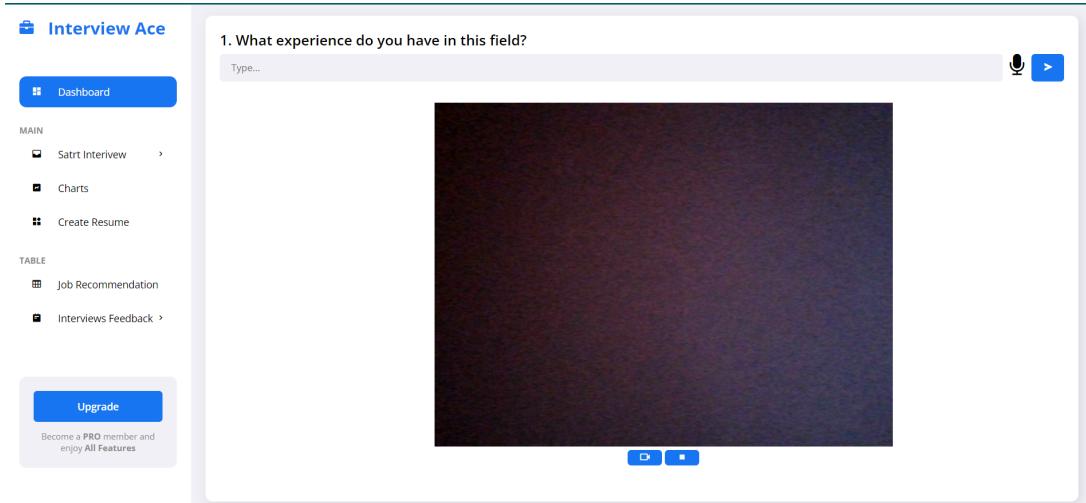
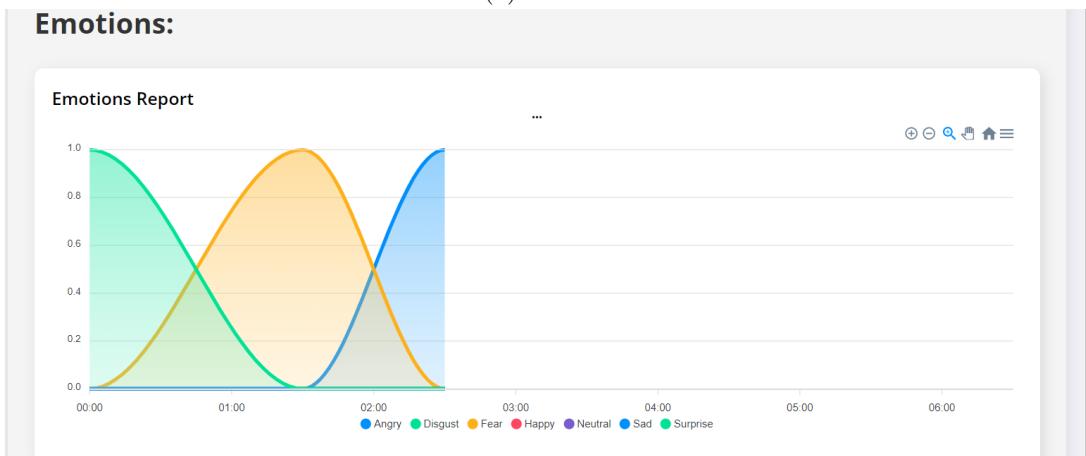


Figure 7. Sample Job Recommendations and Interview Questions

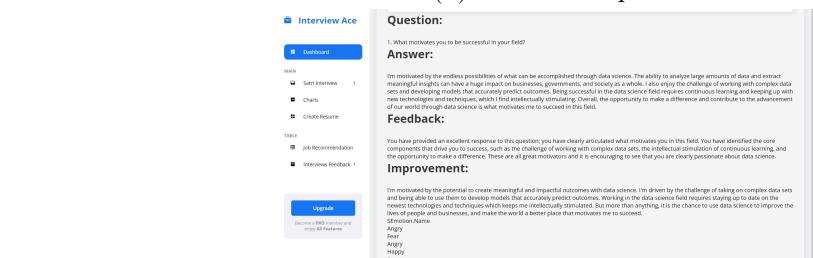
am confident that Interview Ace has the potential to benefit many job seekers and contribute significantly to the field of job search and interview preparation.



(a) Camera



(b) Emotions report



(c) Interview Questions

Figure 8. Sample Emotion Reports and Feedback Report

Chapter

4

Discussion

The Interview Ace system offers several strengths that make it a valuable tool for job seekers. The content-based recommendation system provides users with relevant job postings based on their skills and experiences, saving them time and effort in the job search process. The chatbot feature helps users prepare for interviews by asking relevant questions based on the job they are interested in, and the voice-to-text feature provides users with detailed feedback and suggestions for improvement.

However, the system also has a few weaknesses that need to be addressed. For instance, the emotion report is only available for the first question, and the program sometimes shows the same questions twice in succession, despite using a list containing all the questions provided by the chatbot. Furthermore, each time the send button is clicked, the question is deleted, which can be frustrating for users.

Despite these weaknesses, I am working on developing the emotion recognition system to provide users with more comprehensive emotional feedback during their interview practice sessions. Additionally, in the future, I plan to add a feature that helps users improve their skills by suggesting relevant resources and practice exercises. Moreover, I will add more questions that test specific skills for the user, making the Interview Ace system an even more valuable tool for job seekers.



Conclusion

Interview Ace is an AI-based job search and interview preparation tool for new graduates, students, and job seekers. The system recommends relevant job postings based on user skills and experience using a content-based recommendation system. The chatbot feature prepares users for interviews by asking questions tailored to the job they are interested in. Additionally, the facial expression recognition system provides users with feedback on their emotional responses, while the voice-to-text feature records and provides feedback on their answers. Interview Ace offers an innovative and valuable solution for job seekers in today's competitive job market.