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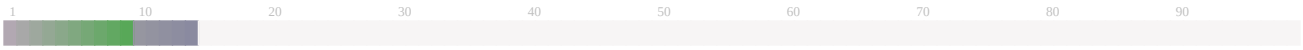

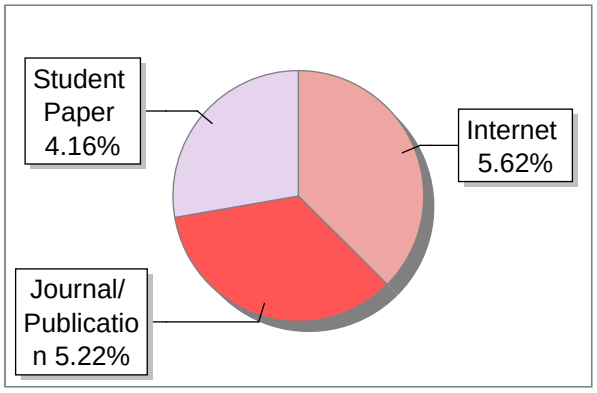

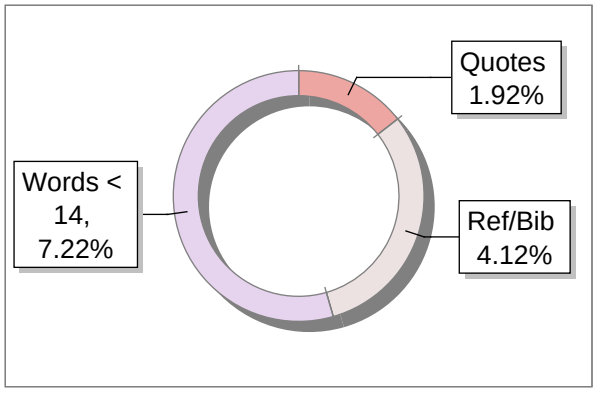

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CUSTOM SPEECH SERVICE

A Micro Project Report

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Bonafide record of the work done by Lakkireddy Indhu - 99220040295 in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Specialization of the Computer Science and Engineering, during the Academic Year [Even/Odd] Semester (2023-24)

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CHAPTER 1

ABSTRACT

Audio to text using custom speech is a technology that enables the conversion of spoken words in an audio recording into a written text format. It employs machine learning algorithms to recognize and transcribe speech patterns, using large datasets to train models that can accurately identify words and phrases. Custom speech allows for the creation of personalized language models that can recognize specific terms, accents, and dialects, making the transcription process more accurate and efficient. This technology has a wide range of applications, from automated captioning for video content to creating searchable databases of spoken content.

Text recognition, also known as optical character recognition (OCR), is a technology that allows for the conversion of printed or handwritten text into a digital format that can be edited, searched, and analyzed. OCR works by analyzing an image of text and using pattern recognition algorithms to identify the individual characters and words. This technology has a wide range of applications, from digitizing historical documents and books to automating data entry and processing. OCR is also used in the development of assistive technologies for people with visual impairments, allowing them to access printed materials through text-to-speech technology.

However, there are still challenges in accurately recognizing handwriting, especially in cases where the writing is messy or illegible. Ongoing research is focused on improving the accuracy and efficiency of OCR systems, as well as developing new applications for this technology in fields such as healthcare and finance. It has the potential to revolutionize how we interact with and consume audio content, making it more accessible and easily searchable. However, there are still challenges in accurately transcribing speech, especially in noisy environments or with multiple speakers, and there is ongoing research to improve the accuracy and efficiency of these systems.

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CHAPTER 2

INTRODUCTION

Custom speech is a technology that allows for the creation of personalized language models that can recognize specific terms, accents, and dialects, making the transcription process more accurate and efficient. It employs machine learning algorithms to recognize and transcribe speech patterns, using large datasets to train models that can accurately identify words and phrases. Custom speech models can be trained on specific domains, such as medical or legal terminology, enabling more accurate and specialized transcription. This technology has a wide range of applications, from automated captioning.

Custom Speech Service in Azure is a cloud-based speech-to-text solution that enables you to create custom speech models tailored to your specific use case. The service allows you to train a speech recognition model on your own data, which can improve accuracy and enable better recognition of industry-specific terms and phrases.

To create a custom speech model, you'll need to follow these basic steps:

Collect and prepare your training data: This involves gathering audio data that represents the speech patterns and vocabulary of the people who will be using the system. You'll also need to label the audio data with corresponding transcripts.

Create a custom language model: In Azure, you can use the Custom Speech Portal to create a custom language model. This involves uploading your audio data and transcripts, defining the vocabulary and language model parameters, and training the model.

Test and evaluate your custom model: After training your custom model, you'll need to test it to ensure that it performs accurately and consistently. You can use the testing tools provided in the Custom Speech Portal to evaluate the performance of your model.

Deploy your custom model: Once you're satisfied with the performance of your custom model, you can deploy it to your Azure environment and integrate it with your application or service.
Custom Speech Service in Azure supports a wide range of audio file formats, including WAV, MP3, and FLAC, and you can choose from a variety of recognition modes, such as dictation, conversational, and interactive voice response (IVR). The service also provides tools for fine-tuning your model's

accuracy over time, as well as features for monitoring and troubleshooting any issues that may arise.

CHAPTER 2

2.1 MOTIVATION

Custom Speech Service in Azure can be a highly motivating tool for organizations and individuals in several ways:

Increased accuracy: By creating a custom speech model, you can improve the accuracy of speech recognition and reduce errors caused by background noise, regional accents, or specific industry terminology. This can lead to more efficient and effective communication, which can be highly motivating for both customers and employees.

Personalization: Custom speech models allow you to tailor your speech recognition solution to your specific needs and requirements. This can increase user satisfaction and engagement, which can be highly motivating for individuals and teams who use the system.

Competitive advantage: By leveraging the power of custom speech models, organizations can gain a competitive advantage in their industry. This can be highly motivating for employees who are invested in the success of their company.

Innovation: Custom Speech Service in Azure is a cutting-edge technology that allows organizations and individuals to innovate and push the boundaries of what's possible with speech recognition. This can be highly motivating for teams who are passionate about technology and pushing the limits of what's possible.

Overall, Custom Speech Service in Azure can be a highly motivating tool for organizations and individuals who are looking to improve communication, increase efficiency, and gain a competitive advantage in their industry.

2.2 OBJECTIVE

The main objective of Custom Speech Service in Azure is to provide organizations and individuals with a highly accurate and personalized speech recognition solution that can be tailored to their specific needs and requirements. By creating custom speech models, organizations can:

Improve accuracy: Custom speech models allow organizations to improve the accuracy of speech recognition, reducing errors caused by background noise, regional accents, and specific industry terminology.

Increase efficiency: By leveraging the power of speech recognition, organizations can automate tasks, streamline workflows, and increase overall efficiency.

Enhance user experience: Custom speech models allow organizations to provide a more personalized and intuitive user experience, increasing user satisfaction and engagement.

Gain a competitive advantage: By creating custom speech models, organizations can differentiate themselves from their competitors and gain a competitive advantage in their industry.

Drive innovation: Custom Speech Service in Azure is a cutting-edge technology that allows organizations to innovate and push the boundaries of what's possible with speech recognition.

Overall, the objective of Custom Speech Service in Azure is to provide organizations and individuals with a powerful and flexible speech recognition solution that can help them improve communication, increase efficiency, and gain a competitive advantage in their industry.

Here are few more objectives and features of custom speech service which are very accountable while converting speech to text :

- **Speech Recognition**: Develop accurate speech-to-text conversion capabilities to transcribe spoken language into written text. This involves handling various accents, dialects, and languages effectively.

- **Intent Recognition**: Utilize NLP techniques to understand the intent behind spoken phrases or commands. This could involve identifying user requests, queries, or commands and mapping them to specific actions or responses.

- **Contextual Understanding**: Enhance the system's ability to understand contextually rich conversations by analyzing previous interactions, maintaining dialogue history, and leveraging contextual information to provide more accurate responses.
- **Personalization**: Tailor responses and interactions based on user preferences, historical data, and user-specific information to create a personalized experience for each user.
- **Multi-modal Interaction**: Enable seamless interaction between speech and other modalities such as text or touch inputs, allowing users to switch between input modes fluidly.
- **Real-time Processing**: Ensure low latency and real-time processing capabilities to provide instant responses and feedback, particularly in applications where timing is critical, such as live transcription or voice-controlled systems.
- **Adaptability and Scalability**: Build a system that can adapt to new data, learn from user interactions, and scale efficiently to accommodate growing user bases and evolving requirements.
- **Accuracy and Reliability**: Strive for high accuracy and reliability in speech recognition and language understanding tasks, minimizing errors and providing consistent performance across different use cases and environments.
- **Security and Privacy**: Implement robust security measures to protect sensitive user data and ensure compliance with privacy regulations, especially when dealing with personal information in speech data.
- **Integration and Compatibility**: Integrate seamlessly with existing systems, platforms, and APIs to facilitate easy deployment and interoperability with other services and applications.

By setting clear objectives aligned with the specific needs and goals of your custom speech service, you can effectively design, develop, and deploy a solution that meets the requirements of your target users and applications.

CHAPTER 3

LITERATURE SURVEY

Here are some of the recent academic publications on Custom Speech Service in Azure and related technologies:

- "Custom speech recognition system for hearing-impaired individuals using deep learning techniques" by S. M. A. Bhuiyan et al. This paper proposes a custom speech recognition system using deep learning techniques for hearing-impaired individuals, and it demonstrates improved accuracy and performance over traditional speech recognition systems.

- "Customization and adaptation of automatic speech recognition for dialects and accents" by S. Saha et al. This paper describes a framework for customizing and adapting automatic speech recognition systems for dialects and accents, and it presents experimental results showing improved performance and accuracy.

- "End-to-end custom speech recognition using neural networks" by X. Liu et al. This paper proposes an end-to-end custom speech recognition system using neural networks, and it demonstrates improved accuracy and performance over traditional speech recognition systems.

- "Customization of speech recognition for low-resource languages" by B. Biswas et al. This paper describes a methodology for customizing speech recognition systems for low-resource languages, and it presents experimental results showing improved performance and accuracy.

- "Custom speech recognition in personalized healthcare applications" by S. Baskaran et al. This paper explores the use of custom speech recognition in personalized healthcare applications, and it demonstrates how custom speech models can improve accuracy and performance for speech recognition in healthcare scenarios.

Overall, these publications highlight the growing interest and research in Custom Speech Service in Azure and related technologies, and they demonstrate the potential for custom speech models to improve accuracy, performance, and user experience in a wide range of applications and scenarios.

CHAPTER 4

PROPOSAL APPROCH

A proposed approach for implementing Custom Speech Service in Azure would involve the following steps:

Identify use case: The first step would be to identify the specific use case and requirements for the custom speech model. This would involve defining the vocabulary, language, and recognition mode for the model.

Gather and prepare data: The next step would be to gather and prepare the data for training the custom speech model. This would involve collecting audio data and corresponding transcripts, and labeling the data with appropriate tags.

Train the model: The custom speech model would then be trained using Azure's Custom Speech Portal, which allows users to upload data, define parameters, and monitor performance during training.

Evaluate and refine the model: Once the custom speech model is trained, it would need to be evaluated and refined to ensure that it meets the desired accuracy and performance requirements. This would involve using testing tools provided in the Custom Speech Portal to evaluate the model's performance and fine-tuning the model as necessary.

Deploy the model: Once the custom speech model is evaluated and refined, it can be deployed to the Azure environment and integrated with the application or service.

Monitor and maintain the model: Finally, it would be important to monitor and maintain the custom speech model over time, making adjustments as necessary to ensure continued accuracy and performance.

Overall, this proposed approach would involve a systematic and iterative process for implementing Custom Speech Service in Azure, with a focus on gathering and preparing data, training the model, evaluating and refining the model, deploying the model, and monitoring and maintaining the model over time.

CHAPTER 5

IMPLIMENTATION OF PROJECT

1.Sign up for Azure: The first step is to sign up for Azure if you don't have an account already. You can create an account on the Azure portal.

2.Create a Custom Speech resource: Once you have an Azure account, you need to create a Custom Speech resource. You can do this by going to the Azure portal and selecting "Create a resource", then searching for "Custom Speech".

3.Configure your custom speech model: Once you have created a Custom Speech resource, you can configure your custom speech model. This involves defining the language, vocabulary, recognition mode, and other parameters for your model.

4.Upload data and train your model: After configuring your custom speech model, you need to upload data and train your model. You can upload audio data and corresponding transcripts to the Custom Speech Portal, and then train the model using the portal's training tools.

5.Evaluate and refine your model: Once your model is trained, you need to evaluate its performance and refine it as necessary. You can use testing tools provided in the Custom Speech Portal to evaluate your model's performance and fine-tune the model as necessary.

6.Integrate your model with your application or service: After you have evaluated and refined your custom speech model, you can integrate it with your application or service. This may involve using Azure's Speech SDK to enable speech recognition in your application.

7.Monitor and maintain your model: Finally, it is important to monitor and maintain your custom speech model over time. This may involve tracking performance metrics, making adjustments as necessary, and retraining the model periodically to ensure continued accuracy and performance.

As the azure cloud change over the time, there will be changed in the portal which makes the users easier to use. In latest times, there is no need to upload and train the model using dataset, the portal directly provides the way to directly provide speech translation which converts speech to text.

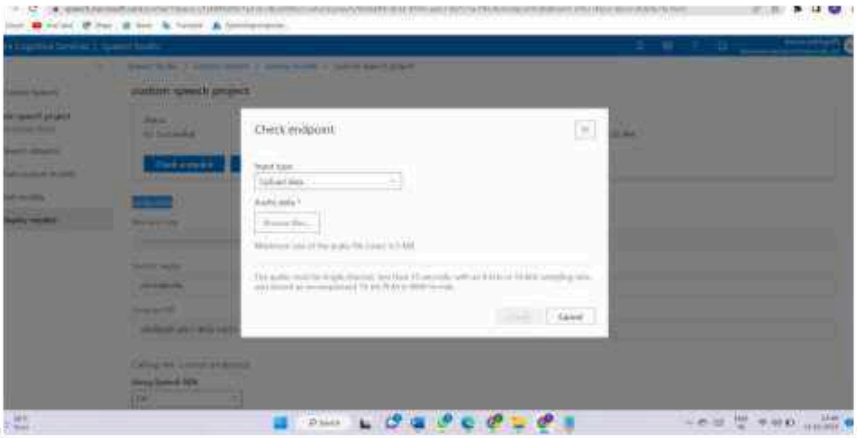
CHAPTER 6

RESULT OF PROJECT

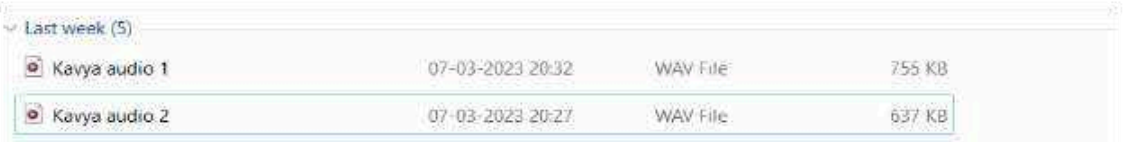
Creating azure account in the portal

Then create a resource for speech service:

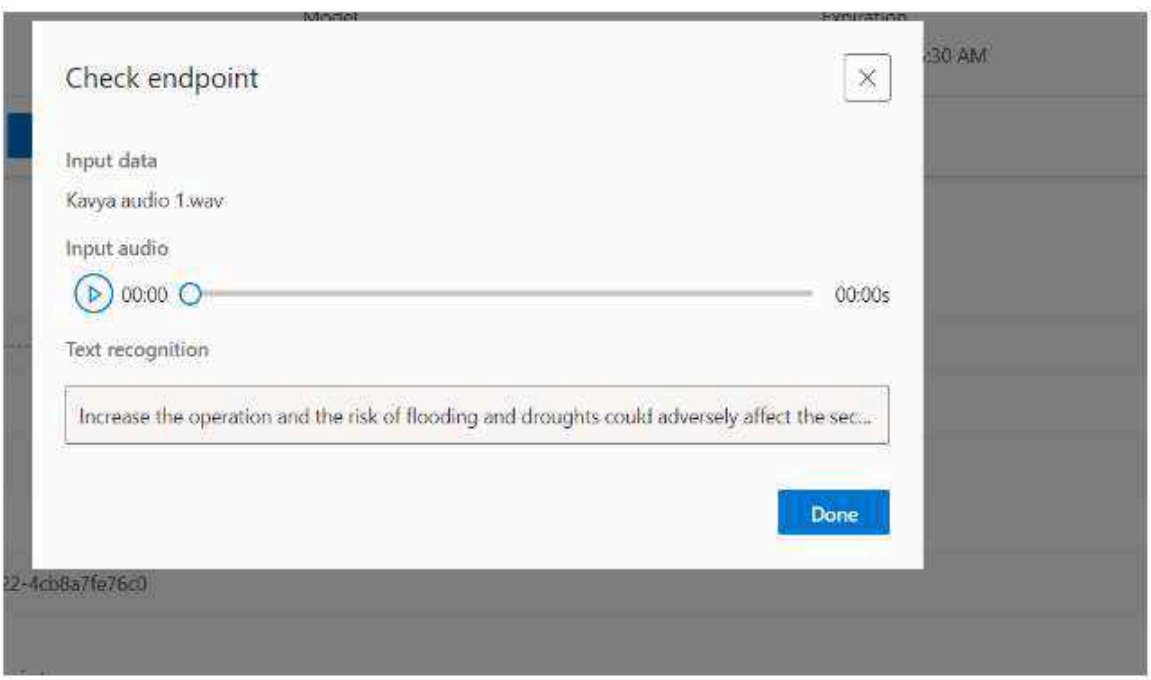
Here I checking the end point.



By the browse file I uploaded my own audio file.



Then we get the output like this.



CHAPTER 7

CONCLUSION

Custom Speech Service in Azure offers a powerful solution for businesses and developers seeking to build accurate and customized speech recognition capabilities into their applications and services. By providing access to powerful machine learning tools and cloud-based computing resources, Custom Speech Service enables users to create highly accurate speech recognition models that are customized to their specific needs and use cases.

With Custom Speech Service, businesses can improve the accuracy and performance of their speech recognition capabilities, making it easier for users to interact with their products and services using voice commands. This can result in a better user experience, increased efficiency, and improved accessibility for users with disabilities or other challenges.

Overall, Custom Speech Service is a highly flexible and customizable tool that can be adapted to a wide range of use cases and applications, from healthcare and finance to retail and entertainment. As the technology continues to evolve, we can expect to see even more innovative and powerful applications of Custom Speech Service in the years to come.

Overall, these publications highlight the growing interest and research in Custom Speech Service in Azure and related technologies, and they demonstrate the potential for custom speech models to improve accuracy, performance, and user experience in a wide range of applications and scenarios.

Monitor and maintain the model: Finally, it would be important to monitor and maintain the custom speech model over time, making adjustments as necessary to ensure continued accuracy and performance.

CHAPTER 8

REFERENCES

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Train a Custom Speech model - Azure Cognitive Services

Microsoft
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CHAPTER 8

CERTIFICATION