Text to Speech and Speech to Text Converter Using Python

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1. Introduction

This project, titled 'Text and Speech Converter Using Python', is developed to convert text into speech and speech into text using Python libraries such as pyttsx3 and speech_recognition.

2. Objectives

• To implement text-to-speech and speech-to-text functionalities.

• To develop a user-friendly interface for text and speech conversion.

3. Software and Libraries Used

• Python version - 3.10.11

• pyttsx3 - for Text to Speech conversion(works offline)

• speech_recognition - for Speech to Text conversion(works offline as well as online)

• tkinter - for building the Graphical User Interface

4. Implementation

The system provides two main functions:
1. Text → Speech: Converts the entered text into spoken words using the pyttsx3 library.
2. Speech → Text: Records the user's voice through a microphone and converts it into text using the speech_recognition library.

Second phase of the project:-
A graphical interface was created using tkinter for smooth interaction.

5. Screenshots

Below are the screenshots of the implemented project interfaces (ss1(cli based) and ss2(gui based)).

Welcome | SpeechExpertProject.py | Try_Gui.py

SpeechExpertProject.py > main

```python
import pyttsx3
import speech_recognition as sr

def text_to_speech():
    akshat = pyttsx3.init()
    text = input("Enter the text you want to hear: ")
    akshat.setProperty('rate', 170)
    voices = akshat.getProperty('voices')
    akshat.setProperty('voice', voices[0].id)
    print("Speaking...")
    akshat.say(text)
    akshat.runAndWait()

def speech_to_text():
    shah = sr.Recognizer()
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\aksha\Desktop\proj> & C:/Users/aksha/Desktop/proj/.venv/Script
(.venv) PS C:\Users\aksha\Desktop\proj> python SpeechExpertProject.py

============================
 TEXT ⇄ SPEECH CONVERTER
============================
1. Text → Speech
2. Speech → Text
3. Exit
============================
Enter your choice (1/2/3):
```

6. Results

The program successfully performs both conversions with an okayish good GUI. Users can select voice type (male or female)(radio button facility), enter text, or speak into the microphone, and receive accurate output in real time.

7. Conclusion

This project demonstrates the potential of Python in building real-world speech applications. It effectively bridges the gap between human speech and digital communication using accessible open-source libraries.

8. References

Google , Geeks For Geeks (Python: Convert Speech to text and text to Speech - GeeksforGeeks)

youtube :- https://youtu.be/dvTnj4LFk5U?si=LZP6jWLUmHQSCMfx