Sensation Voice Assistant

Aishwarya Tandel, Srinjoy Ghosh, Susma Rai.

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1 Introduction

This code implements a voice assistant called Sensation. The Sensation voice assistant can perform various tasks such as providing the current time, date, day, location, taking pictures, and shutting down the system. It uses speech recognition, text-to-speech conversion, computer vision, and other libraries to achieve these functionalities.

2 Requirements

To run this code, you need the following libraries installed:

- OpenCV (cv2)
- datetime
- requests
- psutil
- re
- json
- time
- threading
- nltk
- sounddevice (sd)
- pyttsx3
- geocoder
- vosk

Additionally, you need to download the NLTK tokenization data using the following command:

```
nltk.download('punkt')
```

You also need to download the Vosk language model and specify its path in the code.

3 Code Explanation

The code can be divided into several sections:

3.1 Imports

The required libraries are imported, including os, cv2, datetime, requests, psutil, re, json, time, threading, nltk, sounddevice, pyttsx3, geocoder, and vosk. The NLTK tokenization data is downloaded using the 'nltk.download('punkt')' command.

3.2 Model Loading and Text-to-Speech Engine Initialization

The Vosk language model is loaded using the specified path. The pyttsx3 engine is initialized for text-to-speech conversion.

3.3 Voice Input Listening

The 'listen()' function is defined to capture voice input from the user. It utilizes the Vosk language model for real-time speech recognition. The audio stream is processed in separate blocks, and the recognized text is returned.

3.4 Memory Clearing Thread

The $`clear_memory_thread()`functionisdefinedtoclearmemoryusageinaseparatethread.Itretrievesthecurr$

3.5 Assistant Response

The 'speak(text)' function is defined to generate the assistant's response. It takes the response text as input, prints it to the console, and uses the pyttsx3 engine to speak the text.

3.6 Utility Functions

Several utility functions are defined to perform specific tasks, including:

- $`get_time()`:Returnsthecurrenttimeinaspecificformat.`get_date()`:Returnsthecurrentdateinaspec$
- $`get_day()`:Returnsthecurrentday.`get_location()`:Retrievestheuser'scurrentlocationusingtheIPaddress$

- ‘take$_p$$icture$()‘ : $Capturesanimageusingthecomputer's camera and save it.$‘$shutdown_system$()‘ : $Shuts down the system if the user confirms.$

3.7 Welcome Message and Command Mapping

The assistant's welcome message is spoken. A dictionary called ‘commands‘ is defined to map specific commands to their corresponding utility functions.

3.8 Voice Assistant Loop

The main loop listens to the user's voice input using the ‘listen()‘ function. If a valid command is recognized, the corresponding utility function is called, and the response is spoken by the assistant. If no valid command is recognized, a default response is given. The loop can be stopped by saying "Stop Sensation," and the assistant will bid goodbye.

4 Usage

To use the Sensation voice assistant, run the code in a Python environment with the required libraries installed. Ensure that the Vosk language model path is correctly specified. Follow the assistant's voice prompts and speak commands such as time, date, day, position, picture, and shutdown to interact with the assistant. To stop the assistant, say "Stop Sensation."