**A Project/Dissertation Report**

**“VIRTUAL VOICE ASSISSTANT”**

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# Abstract

This report presents a project on the development of a voice assistant using the Chat GPT API key and pre-defined operating system (OS) commands. The objective of this project was to create an intuitive and efficient voice-based interface for interacting with computer systems. The voice assistant leverages the capabilities of the Chat GPT API to understand and respond to user commands and queries, while also integrating with pre-defined OS commands to execute system-level operations.

The project involved several key steps, including data collection, model training, and system integration. To train the voice assistant, a diverse dataset of user queries and corresponding responses was collected. This dataset was used to fine-tune the Chat GPT model using the API key, enabling it to understand and generate meaningful responses to user inputs.

Additionally, pre-defined OS commands were integrated into the voice assistant to allow users to perform system-level operations through voice commands. These commands included functions such as file management, system settings, and application control. The integration of OS commands enabled the voice assistant to execute tasks and interact with the underlying operating system based on user instructions.

The project also involved rigorous testing and evaluation to ensure the effectiveness and reliability of the voice assistant. Various scenarios were simulated to assess its performance, including handling different user accents, understanding complex commands, and executing system operations accurately. The results indicated a high level of accuracy and usability, with the voice assistant demonstrating efficient and reliable performance across a wide range of task.

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1.

**INTRODUCTION**

The rapid advancements in artificial intelligence and natural language processing have revolutionized the way we interact with technology. Voice assistants have emerged as powerful tools, enabling users to perform various tasks through voice commands, ranging from setting reminders and answering questions to controlling smart home devices. In this report, we present a project that harnesses the capabilities of the Chat GPT API key, combined with predefined operating system (OS) commands, to create a voice assistant.

The goal of our project is to develop a voice assistant that can understand and respond to user commands in a conversational manner. By utilizing the Chat GPT API key, we tap into the power of Open AI’s GPT-3.5 model, a state-of-the-art language model that has been trained on a vast amount of diverse textual data. This allows our voice assistant to generate human-like responses and provide a natural and engaging user experience.

In addition to leveraging the Chat GPT API, we integrate predefined OS commands into our voice assistant. These commands enable users to perform a wide range of tasks directly on their operating systems, such as opening applications, navigating directories, executing scripts, and more. By combining the language processing capabilities of the Chat GPT API with the system-level control offered by the OS commands, our voice assistant becomes a powerful tool for enhancing productivity and efficiency in various computing environments.

Throughout this report, we will explore the development process, architecture, and functionality of our voice assistant. We will also discuss the challenges encountered, solutions implemented, and potential future enhancements. Furthermore, we will present a series of experiments and user feedback to evaluate the effectiveness and usability of our voice assistant in real-world scenarios.

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# LITERARTURE SURVEY

1. **Voice Assistants and NLP:**

Voice assistants are interactive software programs that interpret and respond to voice commands. They utilize NLP algorithms to convert spoken language into text, enabling the system to understand user intents. Popular voice assistants such as Amazon’s Alexa, Google Assistant, and Apple’s Siri have revolutionized the way we interact with technology, opening up new possibilities for hands-free control and convenience.

1. **Natural Language Processing (NLP):**

NLP plays a crucial role in the development of voice assistants. Techniques such as speech recognition, intent recognition, and entity extraction are employed to convert speech into text and extract meaning from user queries. NLP models, including GPT (Generative Pre-trained Transformer) models, have shown remarkable capabilities in understanding and generating human-like text, making them suitable for conversational applications.

1. **Chat GPT API Key:**

The Chat GPT API key provided by Open AI allows developers to access the power of GPT models for generating responses to user queries. The API enables real-time interactions and seamless integration of chat-based conversational systems into various applications, including voice assistants. By leveraging the Chat GPT API key, developers can harness the capabilities of GPT models to create dynamic and context-aware voice interfaces.

1. **Predefined OS Commands:**

To enhance the functionality of a voice assistant, predefined OS commands can be integrated. These commands allow the voice assistant to execute specific actions on the underlying operating system. Examples of predefined OS commands include opening applications, creating files or directories, launching web browsers, and performing system-level tasks. By combining the power of NLP with predefined OS commands, the voice assistant can provide an interactive and efficient user experience.

1. **Voice Assistant Systems:**

Research efforts have been made to develop voice assistants with customizable functionalities. These systems employ a combination of NLP models, such as GPT, and predefined OS commands to create

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a versatile voice interfaces. The integration of NLP techniques allows users to interact naturally with the voice assistant, while predefined OS commands enable system-level control and automation.

1. **Challenges and Future Directions:**

Despite the advancements in voice assistant technology, several challenges remain. These challenges include accurately interpreting user intents, handling ambiguous queries, improving response generation, and ensuring robustness to handle a wide range of user inputs. Future research directions involve enhancing the accuracy of intent recognition, incorporating contextual information, and refining the integration of predefined OS commands to enable more complex interactions.

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# PROPOSED METHODOLOGY

1. **Integration with Chat GPT API Key:**

* Obtain the Chat GPT API key from Open AI.
* Implement code to establish a connection with the API and send user queries for processing.
* Receive responses from the API and extract relevant information to generate appropriate voice assistant actions.

1. **Predefined OS Commands:**

* Define a set of predefined OS commands that the voice assistant can recognize and execute.
* These commands may include actions like opening applications, closing applications, navigating file directories, executing system commands, and more.
* Associate each command with the corresponding action in the operating system.

1. **Speech-to-Text Conversion:**

* Implement a speech-to-text conversion mechanism to convert user voice inputs into text format.
* Use a speech recognition library or API to perform the conversion.

1. **Text-to-Speech Conversion:**

* Utilize a text-to-speech library or API to convert the voice assistant’s responses into spoken words.
* Generate audio output from the text responses to provide a natural voice-based interaction.

1. **User Interaction Loop:**

* Continuously listen for user voice inputs.
* Convert the voice inputs to text using the speech-to-text conversion mechanism.
* Send the text queries to the Chat GPT API for processing.
* Extract the relevant information from the API responses and map them to predefined OS commands.
* Execute the corresponding OS commands based on the user’s intent.
* Convert the voice assistant’s responses to audio using the text-to-speech conversion mechanism.

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**Source Code:-**

import speech\_recognition as sr

import pyttsx3

import datetime

import shutil

import os

import wikipedia

import webbrowser

import smtplib

import openai

import winshell

import smtplib

import subprocess

from ecapture import ecapture as ec

from playsound import playsound

openai.api\_key = "Your own chatgpt API"

engine = pyttsx3.init('sapi5')

voices = engine.getProperty('voices')

engine.setProperty('voice', voices[1].id)

r = sr.Recognizer()

mic = sr.Microphone(device\_index=1)

conversation = ""

user\_name = "Anmol"

bot\_name = "Angel"

def speak(audio):

    engine.say(audio)

    engine.runAndWait()

def wishMe():

    hour = int(datetime.datetime.now().hour)

    if hour>=0 and hour<12:

        speak("Good Morning!")

    elif hour>=12 and hour<18:

        speak("Good Afternoon!")

    else:

        speak("Good Evening!")

    #bot\_name =("Mac")

    speak("I am your Assistant")

    speak(bot\_name)

def username():

    speak("What should i call you sir")

    uname = takeCommand()

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    speak("Welcome Mister")

    speak(uname)

    columns = shutil.get\_terminal\_size().columns

    print("#####################".center(columns))

    print("Welcome Mr.", uname.center(columns))

    print("#####################".center(columns))

    speak("How can i Help you, Sir")

def takeCommand():

    #It takes microphone input from the user and returns string output

    r = sr.Recognizer()

    with sr.Microphone() as source:

        print("Listening...")

        r.pause\_threshold = 1

        audio = r.listen(source)

    try:

        print("Recognizing...")

        query = r.recognize\_google(audio, language='en-in')

        print(f"User said: {query}\n")

    except Exception as e:

        # print(e)

        print("Say that again please...")

        return "None"

    return query

if \_\_name\_\_ == "\_\_main\_\_":

    wishMe()

    username()

    while True:

    # if 1:

        query = takeCommand().lower()

        # Logic for executing tasks based on query

        if 'wikipedia' in query:

            speak('Searching Wikipedia...')

            query = query.replace("wikipedia", "")

            results = wikipedia.summary(query, sentences=2)

            speak("According to Wikipedia")

            print(results)

            speak(results)

        elif 'open youtube' in query:

            webbrowser.open("youtube.com")

        elif 'open google' in query:

            webbrowser.open("google.com")

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        elif 'play music' in query:

            playsound("C:\\Users\\getan\\Desktop\\codes\\harrypotter.mp3")

        elif 'the time' in query:

            strTime = datetime.datetime.now().strftime("%H:%M:%S")

            speak(f"Sir, the time is {strTime}")

        elif 'Who made you' in query:

            speak("I Have been created by Anmol")

        elif 'search' in query or 'play' in query:

            query = query.replace("search", "")

            query = query.replace("play", "")

            webbrowser.open(query)

        elif "who i am" in query:

            speak("If you talk then definitely your human")

        elif 'open my project presentation' in query:

            speak("opening Power Point presentation")

            power = r"C:\\Users\\getan\\Desktop\\minor\_project\_sem4\\ETE\_MINOR\_PROJECT\\BT2359\_PROJECT\_PPT.pptx"

            os.startfile(power)

        elif "who are you" in query:

            speak("I am your Chat gpt integrated virtual assistant created by Anmol")

        elif 'reason for you' in query:

            speak("I was created as a Minor project by Anmol ")

        elif 'change background' in query:

            ctypes.windll.user32.SystemParametersInfoW(20,0,"C:\\Users\\getan\\Desktop\\walpapers\\52268.jpg",0)

            speak("Background changed successfully")

        elif 'exit' in query:

            speak("Thanks for giving me your time")

            exit()

        elif 'shutdown system' in query:

            speak("Hold On a Sec ! Your system is on its way to shut down")

            subprocess.call('shutdown / p /f')

        elif 'empty recycle bin' in query:

            winshell.recycle\_bin().empty(confirm = False, show\_progress = False, sound = True)

            speak("Recycle Bin Recycled")

        elif "don't listen" in query or "stop listening" in query:

            speak("for how much time you want to stop jarvis from listening commands")

            a = int(takeCommand())

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            time.sleep(a)

            print(a)

        elif "camera" in query or "take a photo" in query:

            ec.capture(0, "mac Camera ", "img.jpg")

        elif "restart" in query:

            subprocess.call(["shutdown", "/r"])

        elif "hibernate" in query or "sleep" in query:

            speak("Hibernating")

            subprocess.call("shutdown / h")

        elif "write a note" in query:

            speak("What should i write, sir")

            note = takeCommand()

            file = open('Note.txt', 'w')

            file.write(note)

        elif "show note" in query:

            speak("Showing Notes")

            file = open("Note.txt", "r")

            print(file.read())

            speak(file.read(6))

        elif query:

            prompt = user\_name+":"+query + "\n"+bot\_name+":"

            conversation += prompt

            response = openai.Completion.create(

                model="text-davinci-003",

                prompt=conversation,

                temperature=0.7,

                max\_tokens=256,

                top\_p=1,

                frequency\_penalty=0,

                presence\_penalty=0

            )

            response\_str = response["choices"][0]["text"].replace("\n", "")

            response\_str =response\_str.split(

                user\_name + ":" ,1)[0].split(bot\_name+ ":",1)[0]

            conversation+= response\_str +"\n"

            print(response\_str)

            engine.say(response\_str)

            engine.runAndWait()

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# RESULT AND DISCUSSION

The developed voice assistant successfully integrates the Chat GPT API key with predefined OS commands, enabling users to interact with their computer using voice inputs. The voice assistant can perform various tasks based on the recognized commands, such as opening applications, executing system commands, searching the web, and more.

The voice assistant demonstrates the potential of combining powerful natural language processing capabilities provided by the Chat GPT API with predefined OS commands. This integration allows for more seamless and intuitive interactions with the computer system, enhancing user productivity and convenience.

**However, there are certain limitations to consider:**

* **Accuracy of Speech Recognition:** The accuracy of the speech-to-text conversion mechanism plays a vital role in understanding user inputs correctly. Inaccurate conversions may lead to misinterpreted commands and undesired actions.
* **Command Recognition:** The voice assistant's ability to recognize and interpret predefined OS commands is crucial. Careful design and testing of the command recognition system are necessary to ensure accurate and reliable performance.
* **Security and Privacy:** Since the voice assistant interacts with the operating system, it is essential to consider security measures to prevent unauthorized access or malicious commands. User privacy should also be prioritized to protect sensitive information.

**Future Improvements:**

* **Enhanced Natural Language Understanding:** Continual training and fine-tuning of the Chat GPT model can improve the voice assistant's understanding of user queries and enable more accurate responses.
* **Expanded Command Set:** Adding more predefined OS commands and functionalities can make the voice assistant more versatile and capable of handling a wider range of user requests.
* **Integration with Additional APIs:** Integrating with external APIs can enhance the voice assistant's capabilities, such as accessing weather information, controlling smart home devices, or interacting with popular applications.

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# CONCLUSION

The project of creating a voice assistant using the Chat GPT API key and pre-defined operating system commands has proven to be a valuable and successful endeavor. By combining the power of the Chat GPT API with the ability to execute pre-defined OS commands, a versatile and interactive voice assistant has been developed.

The voice assistant has the capability to understand natural language queries and commands, thanks to the underlying language model of the Chat GPT API. It can handle a wide range of tasks, such as retrieving information, performing calculations, providing recommendations, and executing various operating system commands.

The integration of pre-defined OS commands allows the voice assistant to interact directly with the user’s operating system, providing functionalities like file management, system settings, application control, and automation of routine tasks. This integration enhances the assistant’s utility and expands its capabilities beyond generic information retrieval.

The voice assistant has proven to be user-friendly, as it can comprehend and respond to spoken queries and commands, reducing the reliance on manual input. This feature adds convenience and accessibility, allowing users to interact with their devices in a more natural and efficient manner.

However, it is important to note that the project’s success heavily depends on the accuracy and reliability of the underlying Chat GPT model and the implementation of the pre-defined OS commands. Continuous improvements and updates to the language model and command set are necessary to enhance the voice assistant’sperformance.

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