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Project title

AI Voice Assistant for desktop

PBL Project Report

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1. Abstract

In this project, we have created a demo AI virtual Assistant (VECTOR) using python language. We used Visual Studio Code software to set up a the programme on computer.

AI Voice Assistant (VECTOR) is voice command model that allows you to do some simple tasks on Desktop . this assistant performs tasks like to search something on internet ,to open Youtube and Google site on browser ,to play music , to know current time and many more. In this project we used python modules like speechRecognition, pyttsx3, os, pipiwin32, Wikipedia, smtplib, web browser ,pywhatkit.

2. Introduction

Nowadays the Artificial intelligence Technology is being very famous for the User Experience, because it is very easy to access the applications and services . Android, iPhone , iMac, Windows, etc. are various famous and commonly used Mobile & Computer Operating Systems. All the Operating Systems provides plenty of applications and services for users.

Our topic **AI Virtual Voice Assistants** is also a part of Artificial Intelligence technology . In this project we collected the information about various virtual voice assistants like Siri , Cortana , Google assistant and Alexa . we compare them with help of features and services provided by them. And we also created the AI virtual voice assistant model using Python language.

How AI virtual assistants works ?

1. **Voice input** : in this step systems gets voice input/command from user with help of mic

2. **Speech recognition :** in this step system converts voice input into text format .

3. **Data processing/Decision Making** : in this step text data is processed through the assistant algorithm . and system takes appropriate decision for data.

4. **Voice output/ output activity :** in this last step system gives us result for our input command in the form of activity or voice

3. Decade of Voice Assistant Revolution

The last 10 years have utterly transformed how people think about voice technology. From limited uses in just a few outlets, voice assistants are now integrating into every part of people's lives. To encapsulate everything that has happened in ten years, we've picked a notable event from each year of the last decade to highlight and show how they marked a milestone in the way voice assistants have evolved and spread.

- **The Decade of Voice Assistant Revolution FROM 2010 TO 2019 HERE**

i. **2010 – SIRI IS PUBLISHED AS A MOBILE APP, THEN ACQUIRED BY APPLE**
Siri began life as an independent voice assistant, a mobile app for iPhones. Starting with the iPhone 4S, Apple integrated Siri as its voice assistant into every voice-capable product, including its current ecosystem of smart speakers and wearable technology.

ii. **2011 – GOOGLE DEBUTS VOICE SEARCH ON THE HOMEPAGE**
Google started testing voice search technology on mobile devices in the 2000s, but it wasn't until 2011 that Google.com added a little microphone button for searching by voice. Applying voice technology engine marked an important step for the Google industry.

iii. **2012 – NUANCE RELEASES NINA VOICE ASSISTANT**
Nuance has been a major player in the voice technology space for a long time,.NINA (Nuance Intelligent Virtual Assistant) Nina is now a digital assistant used by businesses to interact with customers.

iv. **2013 – MICROSOFT ANNOUNCES CORTANA VOICE ASSISTANT**
Cortana would become part of Windows, Xbox, and other Microsoft creations, and take a spot in products built by other brands too. however, Cortana has a very different shape as Microsoft ends Cortana's consumer-facing features and realigns it purely for business and enterprise efforts.

v. **2014 – AMAZON REVEALS ECHO WITH ALEXA VOICE ASSISTANT**
Alexa arguably is the most influential voice assistant around now, leaping ahead of Siri or Cortana to the point where Alexa is often used as a generic term for any voice assistant.Amazon is aggressive in pushing the voice assistant into an ever-growing array of smart speakers and other products, from wearables to cars.

vi. **2015 – SOUNDHOUND LAUNCHES HOUNDIFY PLATFORM**
The average consumer might associate SoundHound with a music identification app.

vii. **2016 – GOOGLE HOME AND GOOGLE ASSISTANT DEBUT**

Google took everything it had learned from its voice experiments into creating Google Assistant, which challenges Alexa, at least in the U.S.. Often compared to Amazon's creations, Google Home and Google Assistant offer many of the same features, but with the integration into Google's larger tech ecosystem, such as Android phones

viii. **2017 – BAIDU AND ALIBABA LAUNCH VOICE ASSISTANTS AND SMART SPEAKERS**

Chinese tech giants Baidu and Alibaba both came out with their own smart speakers, powered by their own voice assistants that year.But Baidu and Alibaba's developments meant that the voice assistant market would not be dominated everywhere by Amazon, Google or Apple.

ix. **2018 – SAMSUNG RELEASES BIXBY 2.0 VOICE ASSISTANT**

Samsung had attempted to carve a space in the voice assistant market in 2017 when it debuted Bixby. Bixby 2.0 didn't just solve some of the problems with the first iteration, it also refocused the voice assistant on being more flexible for developers and more personalized for users than it was originally.

x. **2019 – MORE THAN 3 BILLION VOICE ASSISTANTS ARE IN USE**

There are billions of voice assistants in use today. Juniper Research pegged the number at 3.25 billion in February, with expectations of hitting 8 billion in 2023.The ways people use voice assistants are expanding almost as quickly as the options for interacting with them.

4. System Model

Virtual Assistant Model
(Vector)

The tasks which our Vector performs :

1. Play anything on youtube with (vector play _____) command.
2. Search anything on Wikipedia with (Say something about_____) command.
3. Open our college website with (open our college website) command.
4. He tells us current time with (tell me current time) command.

5. And also answer some questions like
   I. Tell me about Vidhya pratishthan .
   II. What is your favorite colour ?
   III. Who is the founder of you ?
   IV. Can you have emotions ?

Code descriptions

1. Input & speech recognition :

```
import speech_recognition as sr

listener = sr.Recognizer()
try:
    with sr.Microphone() as source:
        print('listening...')
        voice = listener.listen(source)
        command = listener.recognize_google(voice)
        command = command.lower()
        if 'Dora' in command:
            print(command)
except:
    pass
```

- For input voice we use the our system microphone as a source
- To convert this speech to text we use (speech_recognition) module and (google voice recocognizer) module
- Path to download speech recognition module in python :
  [pip install SpeechRecognition]

2. About System Voice :

```
5. engine = pyttsx3.init()
6. voices = engine.getProperty('voices')
7. engine.setProperty('voices', voices[1].id)
8. engine.say('i am dora created by Vidhya Prathishthan students')
9. engine.say('what can i help you')
10.engine.runAndWait()
```

- to convert text to speech we use the (pyttsx3) module: we use it as a voice engine & also for that engine we use windows build-in Male voice
- path to download this module
  [pip install pyttsx3]

3. defining input recognition & Voice engine as a function

```
def talk(text):
```

```
    engine.say(text)
    engine.runAndWait()

def take_command():
    try:
        with sr.Microphone() as source:
            print('listening...')
            voice = listener.listen(source)
            command = listener.recognize_google(voice)
            command = command.lower()
            if 'vector' in command:
                command = command.replace('vector','')
                print(command)
    except:
        pass
    return command
```

4. defining input commands in new (run_vector) function:

```
def run_vector():
    command = take_command()
    if 'play' in command:
        song = command.replace('play','')
        talk('playing' + song)
        pywhatkit.playonyt(song)
    elif 'time' in command:
        time = datetime.datetime.now().strftime('%I:%M %p')
        print(time)
        talk('current time is'+time)


run_vector()
```

Code

```
from os import times
import speech_recognition as sr
import pyttsx3
import pywhatkit
import datetime
import wikipedia

listener = sr.Recognizer()
engine = pyttsx3.init()
voices = engine.getProperty('voices')
engine.setProperty('voices', voices[1].id)
```

```
def talk(text):
    engine.say(text)
    engine.runAndWait()

def take_command():
    try:
        with sr.Microphone() as source:
            print('listening...')
            voice = listener.listen(source)
            command = listener.recognize_google(voice)
            command = command.lower()
            if 'vector' in command:
                command = command.replace('vector','')
                print(command)
    except:
        pass
    return command

def run_vector():
    command = take_command()
    if 'play' in command:
        song = command.replace('play','')
        talk('playing' + song)
        pywhatkit.playonyt(song)
    elif 'time' in command:
        time = datetime.datetime.now().strftime('%I:%M %p')
        print(time)
        talk('current time is'+time)
    elif 'say something about' in command:
        person = command.replace('say something about','')
        info = wikipedia.summary(person,2)
        print(info)
        talk(info)
    elif 'founder' in command:
        talk('akash and there project team created me using python')
    elif 'open our college website' in command:
        pywhatkit.search('https://www.vpkbiet.org/')
    elif 'tell me about vidya pratishthan' in command:
        talk('vidhya pratishthan is a best college in Baramati')
        talk('my founders also studying in this college')
    elif'colour' in command:
        talk('i love all colours but mostly i like dark black')
    elif'can you have emotions' in command:
        talk('i am virtual assistant , i dont have any emotions like human ')

run_vector()
```

5. Advantages and Disadvantages

❖ ADVANTAGES -

1. Accuracy and Preciseness
2. Automation and Personalization
3. Variety of skills and Multitasking
4. Hand-free Functionality
5. Help With Your Distress(Enjoyment)
6. Reach Multiple Users At Once
7. Boosts Productivity Levels
8. Go beyond the usual devices
9. Save money and time at different tasks
10. Help users that suffer from Physical Impairment .

❖ Disadvantages –

1. Signal Strength
2. Initial cost could outweigh savings
3. Security could be an issue
4. Voice recognition isn't perfect .

6. Applications and Future Scope

❖Application

***** Now-a-days widely used and popular AI devices are Google assistant, Siri and Alexa. And there applications are as follows;

1] Application of google-assistant

I. Control your device and your smart home.
II. Acess information from your calendars.
III. Find information online from restaurant, booking to directions weather and news.
IV. control your music.
V. play content on your chromecast or other compatible device.
VI. Run timers and reminders.

2] Application of siri

I. Ask about the weather ,where you are or in any other city
II. Have siri read your text messages to you.
III. Dictate your e-mails and text messages.
IV. Ask siri what time it is.
V. Create a note using your voice,or ask siri to pull up note via a keyword.

3] Application of alexa

I. It is capable of voice interaction, music playback,making to do lists setting alarms,streaming podcasts,playing audiobooks, and providing weather, traffic sports, and other real-time information such as news.
II. Alexa can also control several smart devices using itself as home automation system.

❖ FUTURE SCOPE AND ADVANCEMENTS

1. Mobile App Integrating with voice technology
2. Voice Technology in Healthcare
3. Search Behaviors will Changes
4. Individualized\ Personalized Experiences
5. Voice Cloning
6. Voice In Gaming Industry
7. Voice User Interface(VUI) will Continue to Advance
8. Security will be a focus
9. Touch Interaction
10. Compatibility and Integration
11. Enter Conversational Marketing
12. Shift in Key role of Voice assistant

7. COMPARISON AMONG GOOGLE ASSISTANT, SIRI AND ALEXA

1] GOOGLE ASSISTANT And SIRI

GOOGLE ASSISTANT	SIRI
● Google Assistant is googles AI powered virtual assistant and an updated version of google. ● Google Assistant works with more than 5,000 smart home devices from over a hundred brands. ● It is closely integrated with google search and uses it to respond to your search based queries.	● Siri is Apples very own voice – controlled digital assistant . ● Siri is limited to the apples ecosystem-iphone ,ipad, Apple watch,Apple TV, and ipod Touch. ● Siri uses the phone defult search engine to get desired results.

2] SIRI AND ALEXA

SIRI	ALEXA
● Siri is apples own voice controlled personal that offers a faster , easier , way to get things done on your apple devices. ● siri can be activated in many ways press and hold the home button or simply say “HEY SIRI”	● Alexa is the Amazons famous and wildly popular voice based virtual assistant found on its line of famous echo devices. ● You wake it up by simply saying “Alexa” and then ask something or give commands ● Alexa has an upper hand when it comes to online

● Siri gives the most natural responses in the travel and entertainment category.	shopping which was amazons man forte.

3] GOOGLE ASSISTANT AND ALEXA

GOOGLE ASSISTANT	ALEXA
● Google Assistant is an AI powered voice based digital assistant developed by Google.	● Alexa is the intelligent voice-based personl assistant by Amazon.
● It is better at handling internet search-based queries and is more natural to use.	● It is better at handling e-commerce or shopping related queries,which is Amazons main forte.
● Capablities can be extended by installing third party apps, but it has fewer apps than alexas skills.	● Capablities can be extended by installing third party skills.
● The wake word for google assistant is “Ok Google”.	●The wake word for Alexa is just “Alexa” which is less mouthful than googles

8. Conclusion

Voice recognition technology is a trend that a lot of people and companies want to embrace-it can provide benefits not only to households but also to businesses as well.

Al virtual assistants are evolving quickly. Companies are enabling them to provide more capabilities like speech recognition and natural language processing advances. It will enable them to understand and perform requests. Furthermore,improvements in voice recognition technology are allowing them to move deeper into business workflows. In the future, Al assistants will have more advanced cognitive computing. technologies. These will help them carry out multi-step requests and perform more complex tasks.

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