AI DIGITAL ASSISTANT

PROJECT SYNOPSIS

OF MINOR PROJECT

DIPLOMA

CSE

Submitted by

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Introduction:

In our Project, we are going to develop a Digital Assistant based on Artificial Intelligence named as "**Sarah**" primarily **for desktop**. We first need to understand what a Digital Assistant is. A **Digital assistant** is an advanced computer program that simulates a conversation with the people who use it, typically over the internet. Digital assistants use advanced artificial intelligence (AI), natural language processing, natural language understanding, and machine learning to learn as they go and provide a personalized, conversational experience. By learning a user's history, preferences, and other information, digital assistants can answer complex questions, provide recommendations, make predictions, and even initiate conversations. So, our Digital Assistant "Sarah" would provide variety of features and services to the user, ranging from streaming YouTube to Social Media Management and from Healthcare to Hotel Reservation, all these services will be provided by Sarah to the users. Sarah will be accessible primarily on Desktops/Laptop/PCs.

The complete project is purely based on the concept of "Artificial Intelligence". Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal. A subset of artificial intelligence is machine learning, which refers to the concept that computer programs can automatically learn from and adapt to new data without being assisted by humans. Deep learning techniques enable this automatic learning through the absorption of huge amounts of unstructured data such as text, images, or video.

So, to develop our Digital Assistant, we will be using following Technologies and Languages:

1. Python
2. C/C++
3. Django
4. AJAX
5. Visual Studio

Objectives to Accomplish:

1. Voice Recognition along with Text to Speech: using this feature, the user can interact with Sarah with his/her voice, and Sarah can perform the function of text to speech.
   Additional Features which will provided through voice-based commands are:
   a. Email Management using Voice command: Sarah can send email to any email-address along with attachments.
   b. On demand Search Queries on Google/Wikipedia.
   c. 'Set a Reminder' feature.

d. ‘Set an Alarm’ feature.
e. Executing tasks based on Logical Queries (example: Take a screenshot, Switching between tabs, Mathematical Calculations etc).
f. Opening and closing any application on the Device.
g. Managing the Operating System (Restart, Shutdown and Sleep).
h. Play the Song which the user provides as input (both online/offline).
i. ‘Wake-up Sarah’ command to activate Sarah.
j. Weather forecast feature: Will provide the weather forecast as per the user’s location or the Location provided by the user.
k. News updates feature: Will provide the latest news to the User.

2. Healthcare with AI: by using this feature, the user can interact with Sarah for getting help regarding medical issues. Sarah can help the user for the following:
   a. Gathering input of Symptoms from the user: By this Sarah gathers basic necessary information from the user regarding his/her condition (age, symptoms, allergies etc) for the best possible diagnosis.
   b. Recommendation of Medication for Symptomatic relief: Sarah will give the best possible recommendation of medication to the user, based on the symptoms provided by him/her.
   c. Diagnosis Algorithm: Through this algorithm, Sarah will process all the information (symptoms, age, gender etc) to analyze the information step by step and thus provide the best possible diagnosis to the user.
   d. Basic Information regarding Medicines: Sarah will provide the user, all the basic information regarding the medicines which the user enquires about.

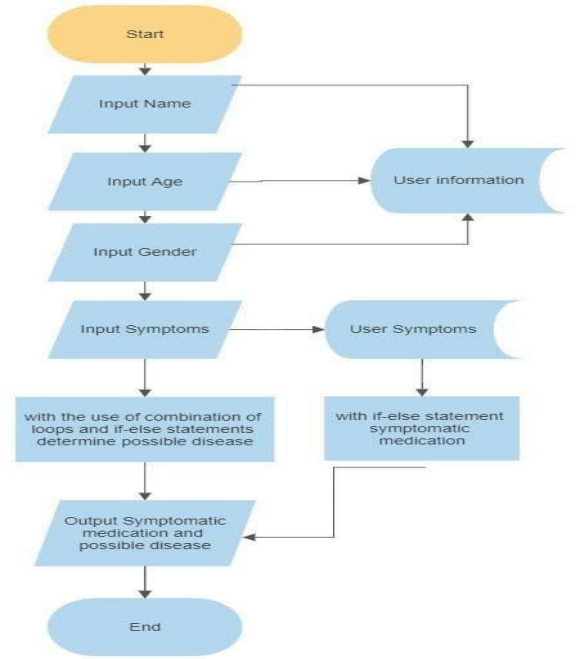

Figure 1: Flowchart showing the Working of Healthcare feature

3. Social Media Management: by using this feature, user can use Sarah for managing his/her Social Media accounts/handles. Sarah can help the user for the following:
    a. Sarah can securely manage Instagram, Twitter, WhatsApp and other Social media Platforms for the user.
    b. Send message on WhatsApp, Tweet on Twitter, post an Image/video/story on Instagram.
    c. Alerts for Personalized notifications for Social media accounts of the user.

4. Face Recognition: by using this feature, Sarah can do the following tasks:
    a. Sarah can easily recognize people by their faces, and it can also remember the people by their names.
    b. Sarah can easily keep a record of the timings as well of the people who tried to unlock the device.
    c. It can easily recognize a person individually amongst a group of people.
    d. It can also recognize every person simultaneously in a group.
    e. Mask detection.

5. Hotel Reservation: by using this feature, Sarah can do the following tasks:
    a. Sarah can easily book a reservation for a Table, Room, Suite etc in a Hotel (We will be using our own Hotel Booking Website ***www.thetablemumbai.xyz***)

6. Door Automation Facility: by using this feature, we assume that there will be a camera attached with the door. Now by using Sarah, the user can set the conditions that on recognizing [by using the Face Recognition objective] which people the door shall unlock.

Literature Survey:

Although we are working to develop an AI Digital Assistant which can run on Desktops, PCs, but we see that today in this world of technology there are many other AI based Digital Assistants majorly available for Smartphones. But there are only few prominent and functional AI Assistants which are available for the platform we are using ie. Desktops/PCs/Laptops. And through our research and survey we came across various Assistants and their features or services provided by them.

Below are some of the renown AI Digital Assistants by which are inspired:

- Cortana: Cortana is a virtual assistant developed by Microsoft, purely based on desktop which uses the Bing search engine to perform **only basic** tasks such as setting reminders and answering questions for the user.

- Siri: is a virtual assistant that is developed by Apple Inc. Siri supports a wide range of user commands, including performing phone actions, checking basic information, scheduling events and reminders, handling device settings, searching the Internet, finding information on entertainment, and can engage with iOS-integrated apps.

- Google Assistant is an artificial intelligence–powered virtual assistant developed by Google that is primarily available on mobile and smart home devices. Users primarily interact with the Google Assistant through natural voice. Google Assistant can search the Internet, schedule events and alarms, adjust hardware settings on the user's device, and show information from the user's Google account, streaming YouTube, and providing weather, sports, playing songs, and other provide news.

- Alexa: is a virtual assistant AI technology developed by Amazon. It is capable of voice interaction, music playback, making to-do lists, setting alarms, streaming YouTube, playing songs, and providing weather, sports, and other real-time information, such as news.

After our survey, we found that basic features provided by any AI Digital Assistant are:

a) Playing a song
b) Setting an alarm
c) Setting a reminder
d) Providing weather report
e) Providing News
f) Opening and closing applications

But almost all of them are dedicated for smartphone devices. Even if there is an AI Assistant for a Desktop or PC, it does not support many of the features which we require in our daily life. There are

many more features which can be added to a **single** AI Digital Assistant by which it could do some more prominent functions. So, by our research we are going to add some additional interesting and productive features to our AI Assistant that can make our lives easier and more efficient. Some of the new features we will add to our AI Digital Assistant “Sarah” are:

i. Premium healthcare and Diagnostic support.
ii. Social Media Account management.
iii. Hotel Reservation.
iv. Read aloud Notifications (Alerts for Personalized Notifications).
v. Face Recognition along with Door Automation facility.

Methodology:

In our Digital AI Assistant: "Sarah", we will do:

1. Base of the Project will be made majorly on Python. The concepts used here while developing Sarah's foundation code, will purely be based upon Artificial Intelligence.
2. After adding all the features proposed in the *Objectives*, for the better visual experience we will create a Graphical User Interface (GUI), by which the user shall interact with Sarah.
3. After the GUI, we will publish it as a software which can be installed on Windows and other platforms.

Modules (of Python) used:

a) For Voice Recognition and other voice-based commands: *pyttsx3, speech_recognition*
b) For managing WhatsApp and Instagram account: *pywhatkit and instabot*
c) For Face Recognition: *face-recognition, numpy, opencv*
d) Many more modules like: *os, smtplib, dlib, webbrowser, wikipedia, pyjokes, sys*

Facilities Required:

- Python should be installed on the system.

- This is an additional objective to our project. Here we have developed our own Hotel Booking website (***www.thetablemumbai.xyz***) using WordPress and other web frameworks for Hotel Booking feature.

Software/Hardware required:

Software Required:

- Visual Studio Code Editor for development using Python 3.8.0
- Bitnami WordPress for development of Hotel Reservation website
- Adobe Photoshop and Adobe After Effects
- Sublime Text Editor 3
- Visual Studio 2019

Hardware Required:

- A webcam for Door Lock Automation
- A mic for Voice Recognition for Sarah to work upon

References:

For Voice Recognition and Text to Speech modules:

- **https://pypi.org/project/SpeechRecognition/**
- **https://pypi.org/project/pyttsx3/**

For Face Recognition Module:

- **https://pypi.org/project/face-recognition/**
- **https://pypi.org/project/opencv-python/**

For Medical research and reference purpose:

- **https://www.webmd.com/**
- **https://ada.com/conditions/**
- **https://emedicine.medscape.com/**

For user's Social Media account management:

- **https://pypi.org/project/pywhatkit/**
- **https://pypi.org/project/instapy/**
- **https://pypi.org/project/email-to/**

For research on Home Automation (only for Door unlocking):

- **https://www.security.org/home-automation/**
- **https://www.vivint.com/resources/article/how-do-smart-locks-work**