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BRAIN – THE A.I. (PERSONAL VOICE ASSISTANT)

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Abstract - *In this paper we introduce, BRAIN – THE A.I. a personal voice assistant that use to take the user commands as input and perform tasks based on the user commands. It provides more efficient and natural interaction with support of multiple voice commands in the same utterance. This assistant has a unique face recognition technique through which only the authorized user can provide the command to the assistant and can perform their various tasks on system. Our proposed system reaches out to help our society by making their work easier as this system can tell the news, search what you want, send email by only your voice command, play game with you, set reminders, tell the location, forecast weather, can tell horoscope of you and endless number of tasks can be done by this. Thus our system can be used for the doing the multi-purpose tasks in robust and flexible approaches.*

Key Words: Speech Recognition, Face Recognition, TTS, Voice command, Voice assistant.

1. INTRODUCTION

Today, we can ask voice assistants like Apple's Siri, Google Now to perform simple tasks like, "What's the weather", "Remind me to take pills in the morning", etc. in our own natural language. The next evolution of natural language interaction with voice assistants is in the form of task automation such as "turn on the air conditioner whenever the temperature rises above 30 degrees Celsius", or "if there is motion on the security camera after 10pm, call Bob". A voice assistant is a digital assistant that uses voice recognition, speech synthesis and natural language processing (NLP) to provide a service through a particular application.

Now everyone wants to have an assistant who listen our call, anticipates our needs and can take necessary action when needed. This luxury life is now available with the help of Artificial Intelligence based on voice assistant.

Voice assistants come's in small packages and can perform a variety of actions after hearing our commands. They can launch apps, open web browser, answer basic informational queries, tell horoscope, calculate your BMI, answer our queries, play music, send email, set reminders, make lists, and do basic math calculations, etc.

1.1 Advantages

Voice Assistant allows you to gain the perks of high-end technology and its functionalities. Our proposed application points to many advantages:

1. Our proposed application provides security to the user as it can authenticate the authorized user using Face Recognition technique.
2. The face recognition technology make the system secure and robust for the user as this does not required any input from the user through keyboard or mouse.
3. The application provides flexibility to the user as it can send email just listening the command given by the user.
4. Our proposed application stores personal information such as location data, reminders and contacts in the notebook.
5. This application includes the functions and services such as: opening system application, event handler, location services, music player service, checking weather, Google search, Wikipedia search, tell horoscope, general conversation and help menu.

2. LITERATURE SURVEY

Yash Mittal el al. [1] proposed a multi-functional `Smart Home Automation System' (SHAS) that can be adapted to a user's voice and recognize the voice-commands, independent of the speaker's personal characteristics such as accent. An Arduino microcontroller board is used for processing and control which makes this system cost effective. Thus for converting existing homes into a smart home this prototype i.e. Smart Home Automation System (SHAS) can be used.

Prerna Wadikar, Nidhi Sargar, Rahool Rangnekar, Prof. Pankaj Kunekar, [2] "Home Automation using Voice Commands in the Hindi Language": The proposed of Home Automation in Hindi language Voice commands was to implemented the dedicated hardware i.e. Arduino Uno and using voice recognition module that makes the system more cost-efficient and robust. The system can work on various connected devices like light, fan, AC, etc. This system allows users to make decisions and to regulate the home appliances with the help of voice assistants.

Steve Joseph, Chetan Jha, Dipesh Jain, Saurabh Gavali, Manish Salvi [7], "Voice based E-Mail for the Blind": They design the system that was helpful for sending emails for the blind people without the need of visual interaction with the screen.

Speech-to-Text Based Life Log System for Smartphones [8], the technique used was Microphone of Smartphone, STT

(Speech-To-Text). From this the user are able to search life log sound files using Text.

Aditi Bhalerao, Samira Bhilare, Anagha Bondade, Monal Shingade, Aradhana Deshmukh [9], "Smart Voice Assistant: a universal voice control solution for non-visual access to the Android operating system", design the voice control solution for the mobile device through which user can do their task without accessing towards their mobile screen.

Chen-Yen Peng et al. [10] designed and built a tailor-made function for users without their attempt. Commands are taken from Google Home's voice recognition and Bluetooth signals are transferred to Raspberry Pi to control the connected devices. The proposed paper mainly focuses on researching combining characteristics of Google Home with Google Assistant Personal Voice Assistant using machine learning and thereby customizing this to meet the new needs of users.

G. KALYAN KUMAR, K. PAVAM KUMAR REDD "CORTANA (Intelligent Assistant)" [11], describe general language and processing capabilities of the Cortana are derived from Tell me Networks and are combined with a Semantic search database called Satori which is very much used in searching the data.

3. SYSTEM ANALYSIS

3.1 Problem Statement

The voice assistant is design to make the work easier of the user. As user can give command to them without making visual access to the screen. The biggest disadvantage of this system is that confidential data can be accessed by unauthorized user so the privacy can be breached. Due to this, the confidentiality, integrity and availability (CIA) of user data is affected. Looking to this problem the security features of "Face Recognition" is designed so that it can detect the authorized user face and take user command as input and provide response via a synthesis voice. Facial recognition technology (FRT) is one of the most controversial new tools. It was first developed in the 1960s. It has recently become accessible to the mass market-to both law enforcement and private consumers. Automatic face recognition involves:

1) Face detection
2) Feature extraction
3) Face recognition.

3.2 Proposed System Feature

1. Python provides a large standard library which includes areas like internet protocols, string operations, web services tools and operating system interfaces. Many high use programming tasks have already been scripted into the standard library which reduces the length of code to be written significantly.
2. Python has clean object-oriented design, provides enhanced process control capabilities, and possesses strong integration and text processing capabilities and its own unit testing framework, all of which contribute to the increase in its speed and productivity. Python is considered a viable option for building complex multi-protocol network applications.
3. A text-to-speech (TTS) system converts normal language text into speech. Synthesized speech can be created by concatenating pieces of recorded speech that are stored in a database. The output is given in the form of speech.
4. This Voice Assistant can benefit large number of users with universal eyes free and hands free voice control of their mobile devices. Its framework may help to shape future voice control devices.
5. Facial Recognition Technique (FRT) has the capacity to eliminate the need for passwords, fingerprint data, and even keys.

4. SYSTEM DESIGN AND IMPLEMENTATION

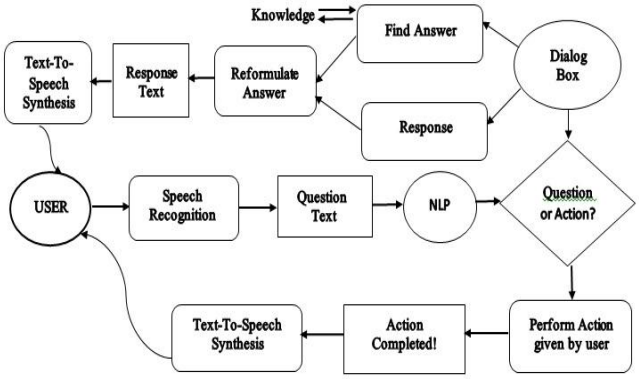

Fig -1: Proposed Model of Voice Assistant

The proposed model of the voice assistant is as shown in the above figure 1. The model consists of user input through microphone to accept commands from the user. These commands are then go through Speech Recognition, it is the ability of a machine or program to identify words and phrases in spoken languages and convert them to a machine-readable format. On these input Natural Language Processing is applied, it is a field which is created by amalgamating computer science and artificial intelligence. Using NLP, we are concerned with interactions between computers and human natural languages. Then the BRAIN check whether it is a question or an action, if it is a action than the action is performed by the voice assistant and acknowledgment is given to the user via a synthesis voice or if it is a question than it is search in dialog box or knowledge base and then response via a synthesis voice to the user. Our Voice assistant uses google text-to-speech API to understand all the words spoken by the user, and based on certain conditions that satisfy being a command the voice assistant sends responses to the user.

4.1 DATA FLOW DIAGRAM

DFD is a graphical representation which provides information flow between input and output data. It is also known as "Data Flow Chart or Bubble Chart". A DFD is often

used as a preliminary step to create an overview of the system, which can later be elaborated.

Level 0 DFD:

The user gives the input in the form of voice; this voice command is recognized by the application. Then it will check whether it is the authorized user, then action is performed as per the command given by the user. Command given is compared as a form of action and question and responsed with the dialog box or search through the knowledge base.

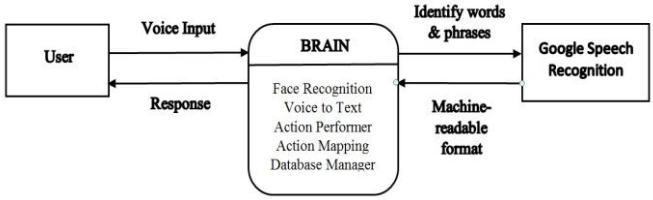

Fig -2: DFD Diagram Level 0

Level 1 DFD:

Input is given by user in the form of voice. GoogleVoiceAPI will convert this voice data in text form and then the action is performed by the voice assistant according to the command given by the user by comparing with the dialog box and knowledge base.

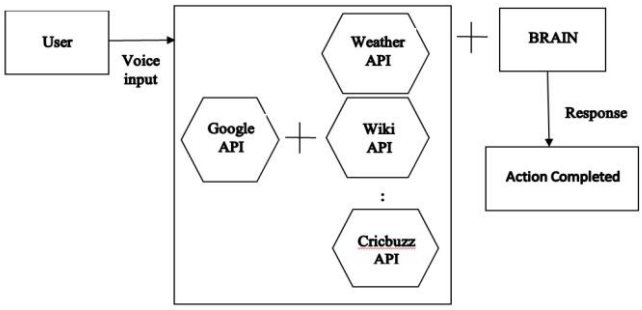

Fig -3: DFD Diagram Level 1

4.2 FLOW CHART

Flow chart is the graphical representation of algorithms. Different symbols are used to represent flow chart. As the system is started, it first authenticate the authorized user, then voice assistant is on running in the background listening for available voice commands; once the user gives a command, based on the conditions provided to the voice assistant, the voice assistant gives the necessary output. This output is sent to the Speech Recognition which is convert the speech into machine-readable form. Based on the input received the personal voice assistant then performs the desired task.

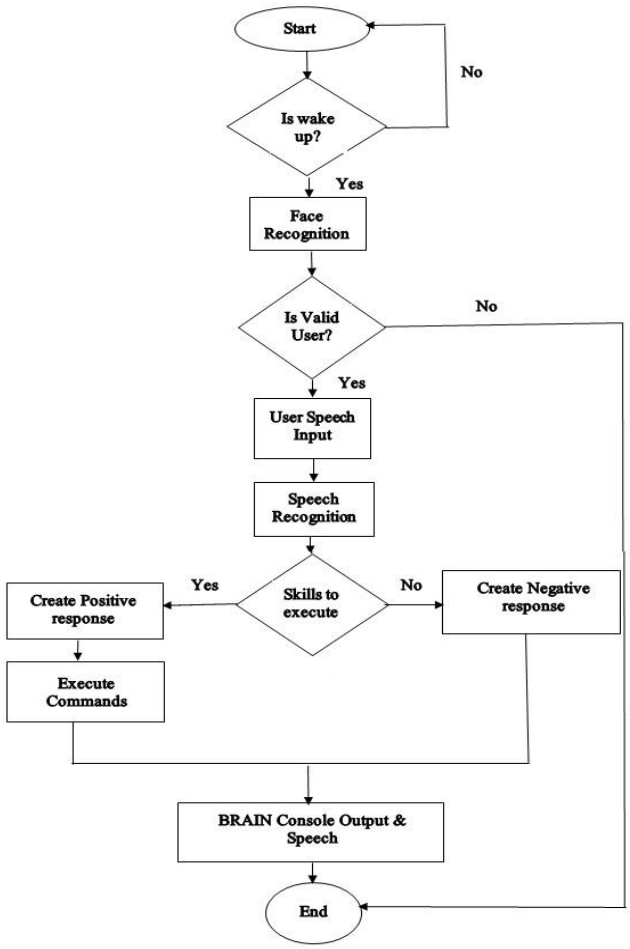

Fig -4: Flow chart of steps taken by BRAIN

5. CONCLUSION

This system is designed in such a method wherein the user can accommodate to it effortlessly. Our proposed system BRAIN – The A.I. a personal voice assistant can be implemented using the face recognition and using speech recognition module thus makes the system more secure and robust. The contributions of Smart Voice Assistant are twofold. First, the face recognition technique make it more secure and robust to use, Secondly, it is the voice control application that provides enhancements to all applications running on a system by synthesizing commands set from on-screen context. BRAIN can benefit large number of users with universal eyes free and hands free voice control of their system. Speech recognition technology is a key technology which will provide a new way of human interaction with machine or tools. The advantage of voice commands over multi-touch when interacting with a screen non-visually is that it does not require targets to be located and thus avoids the problems with pointing, it saves time. The sending of E-mail, and reading of News can be possible by the blind people also. This can do variety of tasks like tell you the time, open application, organized files, can gives updates of matches, play game, tell you the location, tell some jokes, open hackathon, do calculation, updates about the stock and the

endless tasks for the user. Thus making one's life comfortable and at the same time remotely accessible via voice commands.

5.1 FUTURE SCOPE

Using this system as a framework, the system can be expanded to features security. Security is important these days so it can be combined with this system to give more advanced security features. In this, the voice authentication technology can be implemented for more security. More advancement are possible like operating on various tones or accents from different regions that mean it should be able to perform operations on various voice tones and accents.. Further modifications are possible like learning the answer of questions that are not known by the voice assistant and replying whenever next time the same question is put up by the user.

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