

# Stephan-The Personal Assistant

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**Abstract:** - In today's fast moving world, we are compelled to work in proficient manner with celerity .In order to help us to achieve this arduous task, Stephan-The Personal Assistant which is based on the Artificial Intelligence is developed. With its Natural Language Processing abilities and Control logic, it performs the task voiced by user via microphone and after performing required actions, it provides the output in audio form through speaker. It is developed in Python. It provides the user with number of facilities such as opening or closing an application, sending an email, setting an alarm and reminder, chatting ,motion detection facility ,etc., via mere voice commands , hence helps user to avoid performing such mundane tasks manually. Graphical User Interface elucidates this task even further and hence ultimately reduces the daily chaos that user may encounter.

**Key words:** - Artificial Intelligence, Intelligent Personal Assistant, Natural Language Processing, Python.

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## I. INTRODUCTION

We are in the age of Technology. The speed and size by which horizon of technology is augmenting is simply breathtaking. We humans are always on the quest of finding ways to perform task with least efforts and maximum pace. The most leading path of it is advancement of Artificial Intelligence. It is as defined: any device that learns and interprets its environment and takes actions based on this learning that maximize its chance of successfully completing its task. [1] From this, the idea of Intelligent Personal Assistant or IPA came into existence. An IPA is any software that can help user to perform his task usually involving Natural language processing and database for informed decisions. Stephan –The Personal Assistant is IPA developed in python for Ubuntu distribution .It takes input from user in form of voice performs the required operations and provides the output in the same form.

## II. RELATED WORK

**CORTANA:** Cortana, creation of Microsoft has a multilingual support. It accepts around 8 languages around globe as input for query processing. [2]Cortana is able to perform basic tasks such as setting reminder or searching for user query on internet etc. [3][4][5] Cortana also supports music streaming according to user demands.[6] Cortana can be invoked simply with the help of phrase "Hey Cortana". Cortana contains database which keeps track of user's daily routine such as meetings, frequently visited places, contact numbers, hobbies etc. which are useful to understand user's way of

living rather stated technically it allows Cortana to learn user patters and recognize the behavior hence anticipating action to be taken further. [7]Since user have control over this data thus privacy is maintained and user can delete it whenever he wants [8]By means of Cortana user can have access to its android or windows phone's notifications on windows 10 device. Cortana can also solve numerous mathematical equations with ease.

**SIRI:** Like Cortana, Siri is also one of the powerful digital assistant developed by Apple Inc. Siri takes voice commands by user as input and process and display desirable output. Siri helps user to perform day to day tasks with ease such as getting reservation at your favorite restaurant or sending birthday message to someone at the strike of 12 or telling u whether or not it's going to rain etc. [9] Siri also acts as a chat bot which replies to human questions in humorous or sometimes in meaningful way.[10]

**GOOGLE ASSISTANT:** Google is most popular and frequently used search engine around the world. Google Assistant takes this feature to next level which takes human voice as input and saves user's efforts of typing by means of keyboard. Like Cortana and Siri Google Assistant can perform day to day tasks such as setting alarm or reminder or maintaining shopping list etc. Google Assistant has comprehensive way of answering human questions as compared to Siri because Google also keep track of user's browsing history which avails it with wide range of answers.[11]

**ALEXA:** Alexa, virtual assistant developed by Amazon

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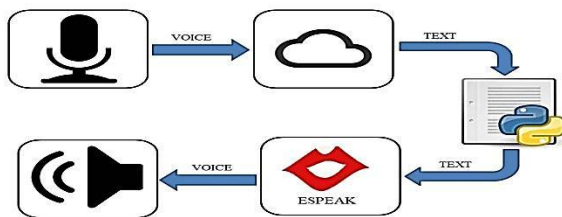
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is also capable of performing tasks like other assistants such as setting alarm or reminder, searching on web for current affairs such as news or sports etc. Alexa identifies “Alexa...” as invoking keyword and start recording user’s voice. This recording is sent over the internet to Amazon which acts as server. As soon as Alexa receives recording file from cloud it delivers the file as output. Processing of this recording file is done by “Alexa Voice Services (AVS)”.[12] This feature is used widely in home automation system. The Home Automation feature was launched on April 8, 2015.[13][14] Alexa can be synchronized with smart home appliances which results in Alexa being able to turn on/off the light or any other home appliance. This feature makes Alexa different from Cortana and Siri as other assistants are not flexible with these types of services as Alexa is. As Alexa requires constant internet support thus poor network connection can make Alexa useless. That is the reason this feature is provided by Amazon free of cost with their devices.[15] As of a partnership with fellow technology company, Microsoft, Alexa is now available via its competing virtual personal assistant, Cortana. With the help of Alexa skill set, developers have succeeded in building a system which will support food home delivery options by means of Alexa. Alexa also works together with the smart lock and the Alexa Cloud Cam included in the service to allow Amazon couriers to unlock customers' front doors and deliver packages inside. [16]

**III. METHODOLOGY**

**A. System Architecture**

As depicted in figure 1, architecture, the user provides the input in voice form via microphone. This input is stored and then sent to Google Speech API. This API converts speech into Unicode format which later is converted to string format for further processing. Hence the obtained python string is passed to main controller module. This python module then calls specific module according to the user query. The output obtained which is in text form is converted into voice form with the help of eSpeak.

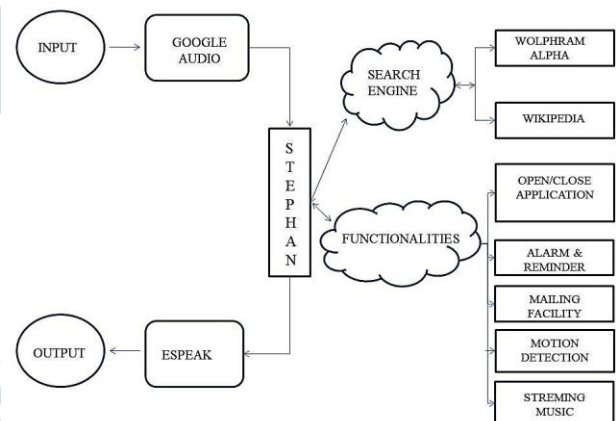


Stephen : System Architecture  
**Fig 1. Basic Architecture of Stephan-The personal assistant”**

**B. Features of the system and components involved**

Following python libraries have been used in the development of this project:

- 1) Tkinter – GUI building library
- 2) Speechrecognition – Speech to Text conversion
- 3) Espeak – Text to Speech conversion
- 4) Wolframalpha – Search Engine
- 5) AIML – To build-up conversational agent (Chat-bot)
- 6) PyAudio – To play and record audio
- 7) Psutil – Retrieve information about running processes and system utilization
- 8) Wikipedia – Search Engine
- 9) Smtplib – For working with E-mail and E-mail servers
- 10) Opencv – For computer vision application
- 11) Pandas – Provides data structure and data analysis



**Fig 2. Functionalities of ‘Stephan-The Personal Assistant’**

The functionalities provided by Stephan are as below:

- 1) Set alarms and reminders  
When user inputs the query like “Set an alarm at...” the alarm is set at specified time and when user gives input in the form of “Set a reminder...”, further details like time and occasion are retrieved from the user then reminder is set.
- 2) Play Music  
When user commands like “Play music”, the default music player of system is launched. Further manipulations like pausing the current song, playing the next song and playing the previous song are also possible.
- 3) Open and close applications  
When the query is in the form of “Open...” and “Close...” followed by the name of the application, the corresponding application is closed or opened as

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instructed by the user.

4) Chat with user

User can chat with Stephan by asking Stephan to “Chat ...” This allows user to interact with Stephan .It makes use of AIML which contains several files which acts as container for several queries and their corresponding responses .They act as brain of Chabot.

5) Send Emails

Stephan when asked to ‘Send an email’ ,It in turns open GUI which has fields for Sender’s ID , Sender’s password , Receiver’s ID and message to be sent. It makes use of Tkinter to create GUI and smtplib for sending mail.

6) Search query on the web

When user asks a random query then that query is searched over the internet using WolframAlpha PI or Wikipedia API and the output is then presented to user in both text and voice format.

7) Motion detection

When user asks to “Start Motion detection...”, webcam and corresponding python script will be launched and then Whenever web cam will sense motion of any object it will store entry and exit time of that object into an excel file and Stephan will notify user accordingly.

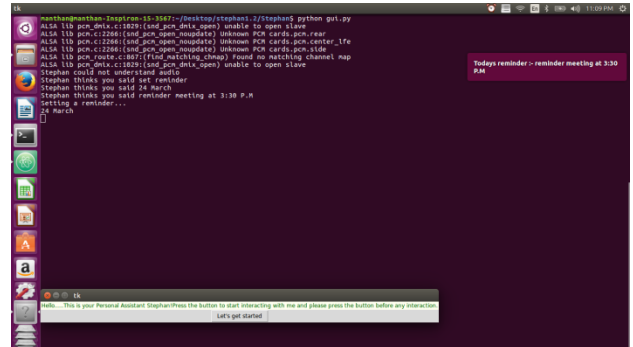


Fig.5. Setting reminder

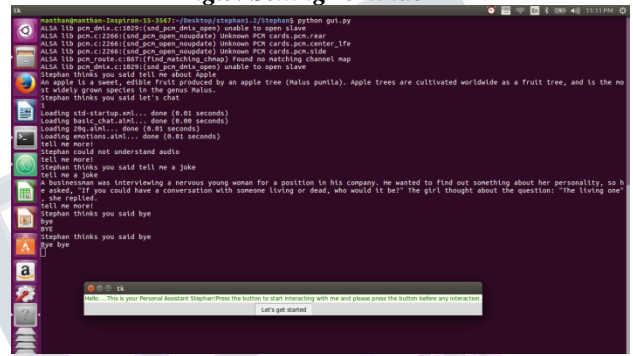


Fig.6. Stephan as Chat-bot

**IV. RESULT**

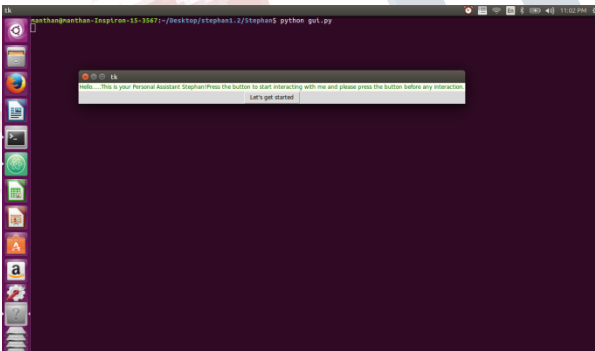


Fig.3. Launching GUI of Stephan

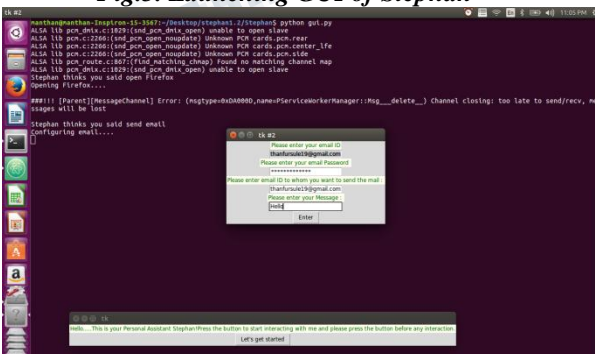


Fig.4. Mailing functionality



	A	B	C
		Start	Exit
1	0	15/05/2018 10:18	15/05/2018 10:18
2	1	15/05/2018 10:18	15/05/2018 10:18
3	2	15/05/2018 10:18	15/05/2018 10:19
4	3	15/05/2018 10:19	15/05/2018 10:19
5	4	15/05/2018 10:19	15/05/2018 10:19
6	5	15/05/2018 10:19	15/05/2018 10:20

Fig.7. Motion detection using Web-Cam

**V. CONCLUSION AND FUTURE SCOPE**

‘Stephan-The personal assistant’ has been developed successfully in Python for Ubuntu Distribution. It

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performs all the functions as per design. Thus it takes input or query from the user via Microphone which in turn is followed by voice analysis and conversion into text then it performs the required operation, finally producing the output in both text and voice form. This allows user to perform various tasks with mere voice command. The future scope of the project is described as below making Stephan more example of Artificial General assistant as opposed to current Artificial intelligence model:

- 1) The user login may be provided which allows Stephan to remember data of each separately. Hence after successful login Stephan can recognize the existing user and perform the tasks considering user specific data.
- 2) In Chatting module, user input interpretation and responses can be enhanced.
- 3) The voice of 'Stephan' may be improved to make it more Human-like.
- 4) Multilingual support may be added so as User can interact with Stephan in language of his preference.
- 5) Map API may be used which will enable 'Stephan' to help user locate nearby places for food, movie, etc
- 6) Offline support for Non-Internet application can be added.
- 7) Stephan may store the data provided by the user as input and it may be used for pattern reorganization which leads to extension of Stephan into Machine learning and data mining and hence making it more intelligent.

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