Artificial Intelligent Responder (A.I.R) Virtual Tutor

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Abstract— **The aim to develop A.I.R. (ARTIFICIAL INTELLIGENT RESPONDER) is to provide a Virtual Tutor (having some sort of intelligent capability) by combining various technology all together for everyone, where we can strive towards providing high quality education. There will be no need to worry about children education and homework. No need to turn on your PC/Laptop to search for solutions for any Query, just ask to AIR and it'll be always ready to search the answer over the internet and convert it to audio Speech within 5-6 seconds (with 1 Mbps internet connection).**

I. INTRODUCTION

The Idea for this project came from the movie "IRON MAN". In the 'Iron Man' films, J.A.R.V.I.S. is the name of Stark's AI system that assists him in any situation. We wished to create something of that sort which help others people to get the relevant answer of their query within few seconds without wasting too much time on internet.

We used the lower version of this project in our university's minor project, which is based on Raspberry pi / Beagle Bone Black Model B MPU. It has the following features: -

1. Smart voice detection
2. Auto Software Noise cancellation
3. Voice to text and vice versa API implementation
4. Implantation of wolfram alpha API
5. creating offline database for quick result and bandwidth saving
6. Creating and implementing command procedure in A.I.R
7. 3.5" IPS touch screen

Now we have further extended this project with the following additional features: -

1. Day/night system
2. Remove language barriers
3. Remove vision barrier
4. Tracking system using camera

5. Increase stability and throughput
6. Power saving

A. Proposed Solution

System becomes online when it detects the human. After that, it greets the person and inquires the query, if any. When the Person asks the question, it acts as an input to the system, software then analysis the voice by various translation and searching mechanism and provide the solution of that query.
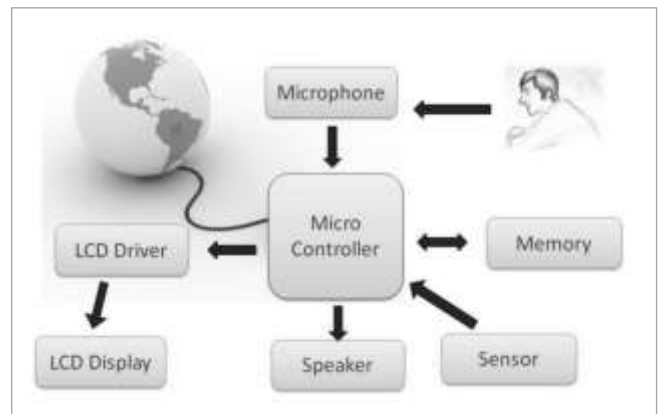
Top level block diagram. Of AIR

As we all know Google has launched Google Now program, which is quiet similar to our project, however there are certain differences between the two.

Every day, questions seem to pop-up in our head and most of us immediately turn to Google for the answers but now thanks to Wolfram Alpha, finding the answers is even easier.

Wolfram Alpha tries to provide exact results rather than providing list of relevant webpages thus saving tremendous amount of time. It can solve Complex queries like polynomial, algebraic and astronomic calculation easily. It providesprecise result of the query inquired.

II. IMPLEMENTATION

A. Hardware Implementation.

We have used the Following components:-
1. Raspberry pi / Beagle Bone Black
3. Ultrasonic Sensor
4. PIR sensor
5. Speaker
6. Camera with mic
7. Button and LED
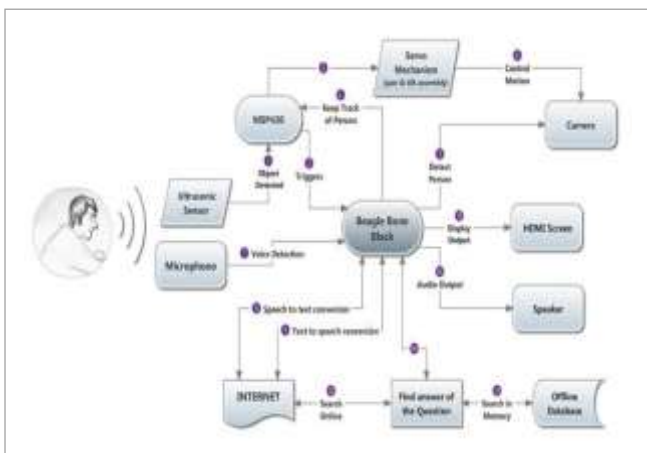
System level Block Diagram of AIR (You must zoom in to view it clearly)

1. Connect Camera with Raspberry pi / Beagle Bone Black using USB HUB.
2. Then connect PIR & LDR sensor using male to female jumper wires.
3. Further Connect 3.5" IPS touch screen
4. At Last Connect two-servo motor to Motor Driver, which connect to Arduino, which further can intercommunicate with Raspberry pi / Beagle Bone Black.
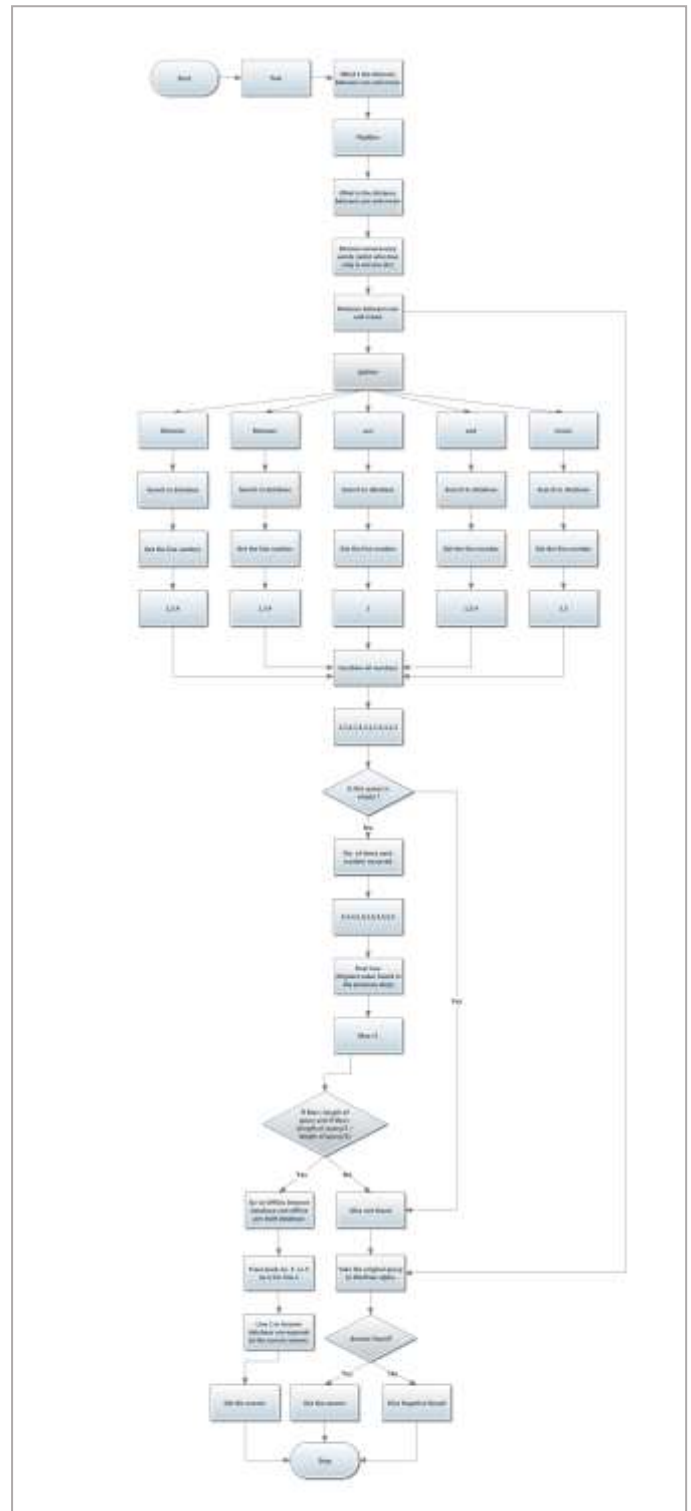
B. Software Implementation.

Incoming Voice acts as an input to the microphone. Convertit into text using Google speech API. When the text returns it goes to session database. After that, it splits into individual words in order to search. System then matches each word in first database i.e. command database if it matches (Matching procedure is performed by our Smart Searching algorithm) it is used to execute the corresponding command. On the other hand, if it does not match, System starts searching the same text now in second database i.e. Offline prebuilt database that store the general day today query. If it matches it return the answer otherwise it starts searching into third database i.e. offline internet database that store the user past internet query results hence result in bandwidth saving and quick responses. If still system is not able to find the answer, query will be submittedto wolfram alpha to get the desired result.

When the system gets the result, it shows it on screen and converts it into speech by using text to speech API. Results are carefully examined by our system in order to understand whether it is suitable to store it into offline internet database or not, using our predefined algorithm which is also created by us.
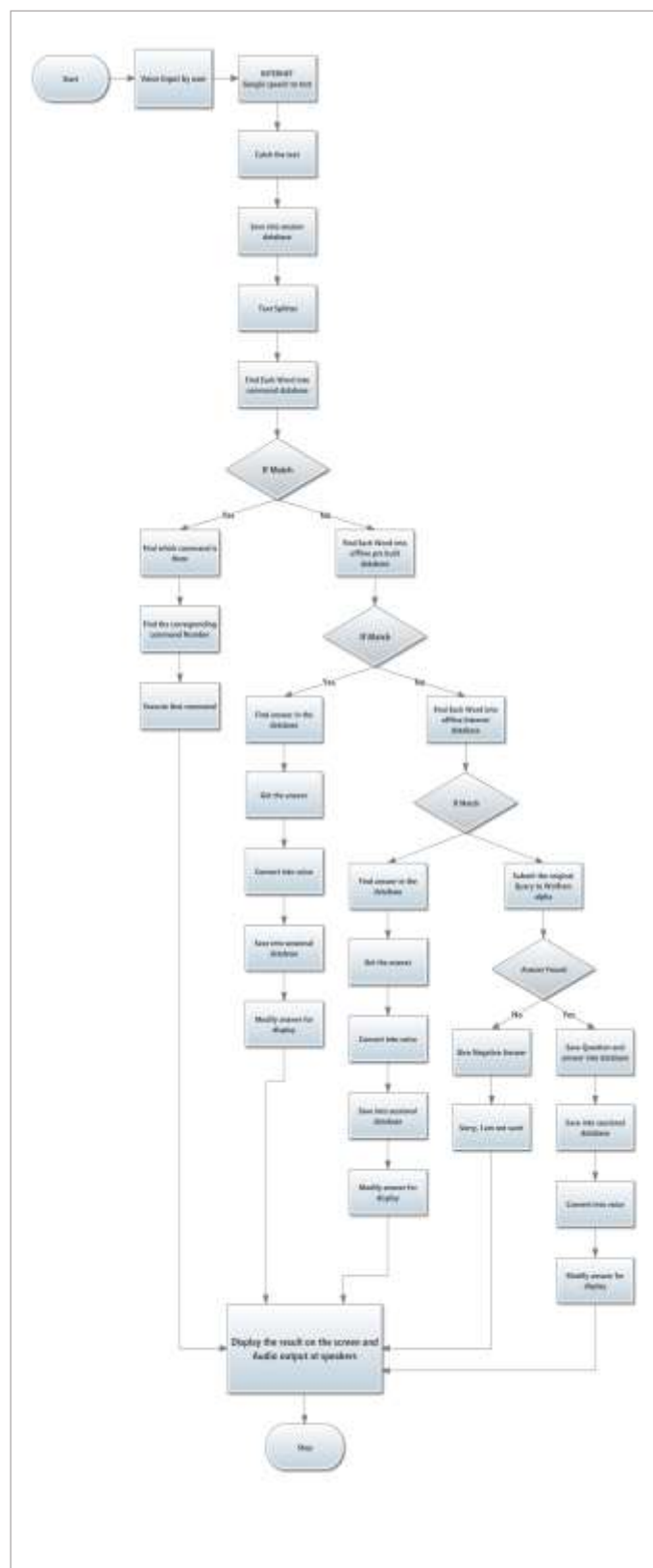
Smart Searching Algorithm logic.

III. CONCLUSIONS

Artificial tutor can be implement by combining the power of hardware along with the software.
Below flowchart, describe systematic logic of A.I.R.

V. REFERENCES

[1] Myers, Courtney Boyd ed. (2009). *The AI Report*. Forbes June 2009.

[2] Rich, Elaine (1983). *Artificial Intelligence*. McGraw-Hill. Pages 7-33

[3] Python Coding. URL www.learnpython.org/ and www.codecademy .com /en/tracks/python.

[4] Linux Commands: http://linuxcommand.org/ & http://linuxsurvival.com/.

[5] Google Speech to text and text to speech api's: https://dvcs.w3.org/hg/ speech-api/raw-file/tip/speechapi.html