

A Review Paper on Smart Home Using Voice Recognition

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Abstract— We are in 21st century, where everything is automatized from home to industrial area. Home automation controls the devices like fan, door, A.C, light,etc. Home automation reduces the human efforts and it also saves energy and time. It is also used for security purposed. Again it is very helpful for the old aged and physically handicapped people which enables them to switching the home appliances from the centralized unit. Voice controlled home automation uses the voice of humans to operate the household devices.Voice command are given to the control unit through a Smart phone. This paper is the review of all such systems.

Keywords- home automation. Smart phone

I. INTRODUCTION

The term 'Smart Home' or "Intelligent Home" is nothing but the automatic control of household devices. It is very useful for the old aged and physically handicapped peoples. Because the electrical switch boards are located at different rooms, due to this they are not able to operate the systems. It makes very difficult to them. So, to overcome this problem the home automation is used. It allows them to control the household devices by giving voice commands using their mobile phone. In this paper we are analyzing the all existing home automation techniques such home automation using ARM9 controller, home automation using RASPBERRY PI kit, home automation using AT89S52. Each technique have the different specification and mode of communications.

II. LITERATURE REVIEW

Smart home is used for the human comfort. It also reduces the human efforts for doing the household work.

AmulJadhav, S.Anand , NileshDhangare, K. S. Wagh [1] describe the approach which we are implementing to control various home appliances with ARM7/9processor and Bluetooth device. Bluetooth is the most chosen technology because it have suitable capabilities. It uses 2400Hz frequency. It is able to provide connectivity up to 100meters. The home appliances are connected to the input/output ports of the embedded system board and their status is passed to the AR9 controller. They have designed an graphical user interfacing wince6.0 which hides the most of the background processes from the user.fig. 1 shows the transmitter system for our project .the input GUI display is fed to the ARM9 with application software(GUI).then it is fed to the Bluetooth dongle and we get the output from the Bluetooth dongle.

Rana,JitendraRajendra And Pawar,Sunil N.[2] From the overall papers reviews, HAS according to never mentioned about the existing physical electrical switches in their system. Without the switches on the wall, the designed system restricted the management solely at the interface. This issue brings in convenient to the folks within the house. This designed system remains the physical switches with the changed low voltage activating methodology, so as to supply safer physical management to the user compared to the standard high voltage switches. The Bluetooth affiliation during this system is established by Bluetooth module that directly receives/ transmits commands from/to ARM9/ARM7. Tharanya associated Sangeetha bestowed a speech recognition based mostly HAS consisting of an internet server application and an mechanical man application. Figure 2 shows the receiver system for this project.power supply is given to the ARM7 .the output of ARM7 is fed to the ULN2003 and the output of ULN2003 is given to the relays and then it is given to the appliances such as DC motor, bulb, fan, etc.

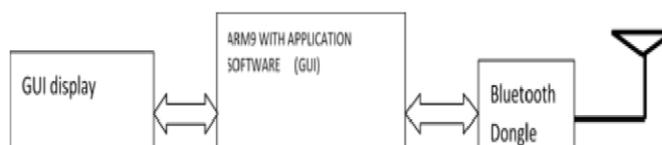


fig.1. Transmitter

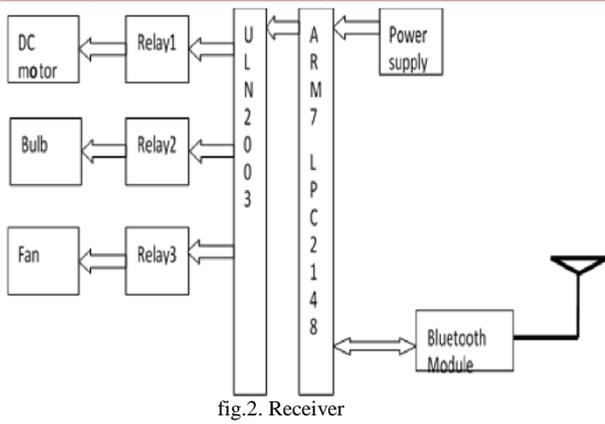


fig.2. Receiver

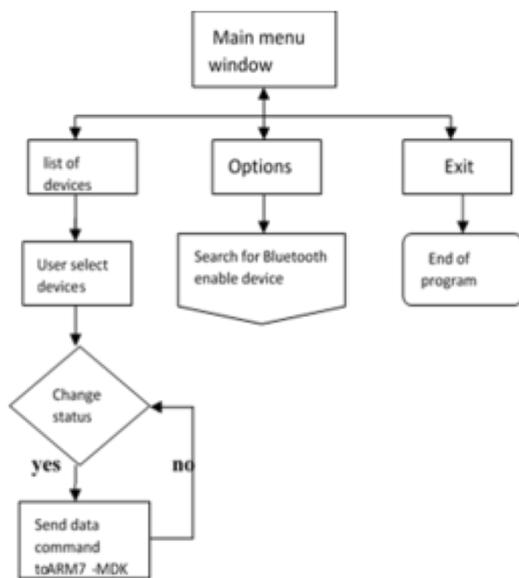


fig.3. Program flowchart for main menu Window of GUI

M. Tharaniya, Soundhari, S. BrillySangita[3] The web server is used to connect various hardware to the microcontroller. The android application is used as an interface to transmit the user commands to the web server, which interprets and takes necessary action. Khusvinder gill projected a system that controls the house appliances employing a ZigBee device regionally, and uses the home's wifi network for remote dominant of the appliances.its main options square measure given as follow

- ❖ It is a capable credit card sized computer that allows developing electronics projects.
- ❖ It is able to interact with the outside world.

Its challenges is to be used by people of all ages to explore computing and to learn programs in Python language and How to manipulate the electronic world around them.

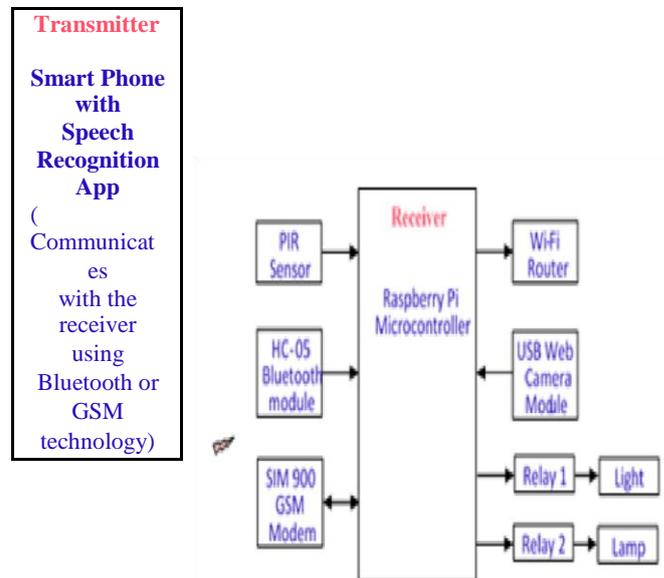


Fig.4. Block diagram of Speech based home automation system

The above figure 4 shows the block diagrams of transmitter and receiver systems of speech based home automation system. Raspberry pi microcontroller is used here. Sensors, Bluetooth module and gsm modem are given as inputs to the microcontroller. the output of microcontroller is given to the relays and wifi router.

Khushvinder Gill, Shuang- Hua Yang , Fang Yao , Xin Lu [4] Sunehra and Veena implemented a home automation system for remote controlling of the home appliances through the subject of an email.

The starting technologies that were used for automation mainly operates one or two devices that means only specific tasks can be performed using these techniques. The term “smart home” was 1st coined by the AMERICAN ASSOCIATION OF HOUSE BUILDERS in 1984. This smart home increase the comfort level of modern generation. It also helps elderly and physically disabled persons. On the basis of study of research papers based on home automation following techniques are discussed. These techniques are given as follows.

Systems based on AT89S52:

This system is a programmable chip (PSoC) based embedded system. It allows us to experiment with many facets of voice recognition technology. It is having a buzzer to give acknowledgement of the voice commands given by user. It gives the acknowledgement in form of beep sound from buzzer when it detects the voice command given by the

user. It identifies the voice of an unknown speaker so it is also useful for security purposes. The system consists of PSoC4, relays, LCD, motor, bulb, speech recognition kit and a mic. Programmable system on chip (PSoC) includes the CPU core and mixed signal arrays of analog and digital peripherals.

- ❖ It can handle n number of tasks simultaneously.
- ❖ It also provides security.

Features of Raspberry pi, ARM9 & AT89S52

1. Raspberry pi

The Raspberry Pi processor is a 700MHz Broadcom system on a chip with a Videocore 4 GPU. This provides OpenGL ES 2.0, hardware-accelerated OpenVG and 1080p HD video. There's also 256MB of on-board RAM and sockets for HDMI, USB 2.0, RCA video, USB 2.0 and 3.5mm audio jacks. The power comes via a MicroUSB connector.

2. ARM9

Pipeline Depth: 5 stage (Fetch, Decode, Execute, Decode, Write)

Operating frequency: 150 MHz

Power Consumption: 0.19 mW/MHz

MIPS/MHz: 1.1

Architecture used: Harvard

MMU/MPU: Present

Cache Memory: Present (separate 16k/8k)

ARM/ Thumb Instruction: Support both

ISA (Instruction Set Architecture): V5T(ARM926EJ-S)

31 (32-Bit size) Registers

32-bit ALU & Barrel Shifter

Enhanced 32-bit MAC block

Memory Controller

Memory operations are controlled by MMU or MPU

3. AT89S52

Microcontroller Features :

A CPU (Central Processing Unit) 8 Bit • 256 bytes of RAM (Random Access Memory) internally.

- Four-port I / O, which each consist of eight bits • the internal oscillator and timing circuits.
- Two timer / counters 16 bits.
- Five interrupt lines (two fruits and three external interrupt internal interruptions).
- A serial port with full duplex UART (Universal Asynchronous Receiver Transmitter).
- Able to conduct the process of multiplication, division, and Boolean.
- the size of 8 KByte EPROM for program memory.
- Maximum speed execution of instructions per cycle is 0.5 s at 24 MHz clock frequency.

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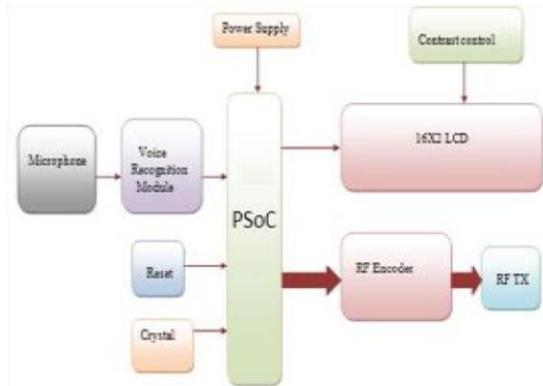


Fig.5. Transmitter system

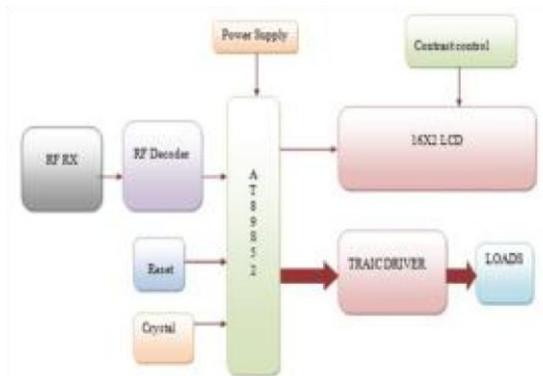


Fig.6. Receiver system

Above figure 5 and 6 shows the transmitter and receiver systems. In the transmitter system the PSoC chip is used and the AT89S52 chip is used in the block diagram of receiver. This system is used for developing the home. It integrates the wired network and develops a wireless network. This technology controls the appliances by giving voice commands to the mobile phone then the mobile phone transmits that signal to the microcontroller and the microcontroller then detects the voice commands and starts executing the programs. It can control n number of household devices such as changing the channel of TV, controlling the speed of fan, controlling the intensity of light, temperature control of AC, etc. Thus, in such ways it will be useful in the future and it is quite interesting too.

IV. CONCLUSION

Voice controlled home automation is growing rapidly day by day. As it is a very useful system rather than the others, it also provides less power consumption. We can also set passwords to the voice of particular users. The features of this system are given below.

- ❖ Less power consumption.
- ❖ Easy to implement.
- ❖ Cost is lower than other systems.

We would thank our guide Prof R. R. Ambalkar sir for giving us all the help and guidance we needed. He motivated us and boosted our confidence

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