A Review on Home Automation using Voice Via Bluetooth Through Raspberry PI 3

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Abstract: **Technology plays a major role in making our home more automated and hence laid back. This review aims to design and implement a cost efficient and yet adoptable, flexible, secure and modern home automation system. This paper review aims to design a prototype implementation of a basic home automation system based on voice recognition system. The system is used to control various home appliances. Automation in which electronic gadgets use in home environment as well as workplace can be controlled by the device itself via unique internet access point in a particular environment the device is connected to IP gateway so that it can be control from anywhere at any place with the help of internet connection. The IP address provided will not function for an individual device but for the entire network to which all the devices are being accessed. The another advantage of this system is to help handicapped and old age people.**

Keywords: **Internet of Things (IoT), Raspberry Pi, Home Automation, Android, Wi-Fi Router, LAMP**

1. Introduction

In this modern era, automation of everything is the need of smart city. Automation is needed to control various equipment's using information technology to regulate equipment's. Home automation means the monitoring and control of household object intelligently for effective usage. The household objects should be intelligently interconnected and provide information for better operation. Home automation augmented with the Internet of Things (IoT) provides better flexibility in managing controlling household object in a wider aspect. This will support the inter connectivity to number of homes for better resource utilization in wider area.

The home automation needs to make use of latest and advance technology. This review aims to design and develop home automation system which is wireless and can be controlled in multiple ways to give more accessibility and control over the system. The purpose to develop and design an automation system which is accessible remotely at the same time locally in a user friendly way. Yet cost effective, robust portable and easily operable so that it could be widely accepted for multiple needs. Wireless communication in home automation is centered on low-power wireless communication

module. Thus it is a potential product to improve the lifestyle of millions and make our home smarter, integrated and collaboratively provide solution that can be controlled from one device. Present day home security technologies such as Samsung Smart Things, Nest cam, AT & T digital life provide smart home security.

However, we find that these systems are not cost effective to be adopted by every household in India. Our motive of review is to study of controlling household devices through voice when we are in home.

2. Literature survey

A. Raspberry pi home automation using android application

This paper refers to home automation via Android system. It links the connectivity with Wi-Fi router via Internet. In this the user will have to communicate with Raspberry Pi through the Internet via Wi-Fi network. This system refers to flexible and scalable, allowing additional home appliances, to be securely and safely added to the home network with minimum amount of efforts. For this the Wi-Fi needs to have adequate strength. This module, the serial data coming from Wi-Fi is connected to Raspberry Pi circuit. The Raspberry Pi board is the main part of home automation [1]. For operation user has given an Android system. It uses relay switch on the device to ON and OFF the given device. This project consists of Raspberry Pi, Relay Circuit, Wi-Fi Router Configuration, Keyboard & Mouse, Interfacing and Working.

Raspberry Pi features Broadcom system on chip (SoC), it includes central processing unit(CPU) and a non-chip graphic processing unit(GPU). It has 1.2 GHz 64/32-bitquad core ARM cortex CPU and on board memory of 1GB RAM. It has one micro SD slot. It has solid state relay(SSR) which is an electronic switching device which switches ON or OFF when external voltage is applied. The Wi-Fi unit is configured for communication and security. It has used keyboard and mouse for operation.

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B. IOT based home automation using raspberry PI

The Raspberry Pi is an invention where a small credit card size computer having large number of peripherals along with communication ports like Ethernet, USB, HDMI port is given. Here the Raspberry Pi is used in four distinct power modes- Run mode, Standby mode, Shutdown mode, Dormant mode. Here relay is used to use a low voltage circuit to turn ON and OFF. For example, 5 Volt power supply is connected to relay and is sufficient to operate 230-volt AC mains. It has used mobile device to operate as server side and client side. Its block diagram is as follows,
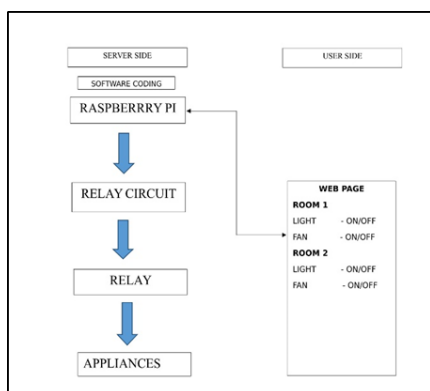

Fig. 1. Block diagram of system

From this paper review we come to know that the project is divided into two sections. One is server side another is client side or user side. The server side is installed on Raspberry Pi whereas the client side is installed on mobile device [2]. Server side is created with the help of LAMP (Linux, Apache, My SQL, PHP). It has used 40 GPIO pins of Raspberry Pi through the relay circuitry for operation. All appliances are connected to relay. User has to use mobile device to access Raspberry Pi via internet. IP address needs to be connect with Raspberry Pi with browser. The UI simply shows the number of rooms and present home appliances. Its programming is done in PHP language.

C. Review of home automation system with speech recognition and machine learning

According to Ant Colony Optimization(ACO) is the heuristic algorithm for solving hard combinatorial problems. The pheromone can be considered as a numerical data for giving probabilistic solutions. ACO components are vast enough to provide a large number of solutions but have heuristics to select some promising output. This paper has concluded some final steps to apply ACO meta heuristic. Initialization, Construct solutions, Apply Local Search, Global Update Pheromones are four major components.

The major processes of speech recognition include feature extraction, acoustic modeling, pronunciation modeling and decoder. The end user gets through the application by means of an applicable input device such as a microphone. Sound waves travel in form of analog signal thus the recognizer first accepts

them as analog signal and converts them into digital signal. In the network, to solve routing problem a different concept of ACO is used in paper and is known as multiple ant colonies optimization (MACO). This algorithm introduces multiple ant colonies to simulate the competition for load balancing within network resources allocation. One new direction of ACO researches that focus on enhancing the performance of ACO and reducing the effect of the search stagnation is the use of Multiple Ant Colonies Optimization (MACO) where several ant colonies work together to collectively solves an optimization problem.

3. Conclusion

This paper review concludes that the user interface of all models are very effective as all models are programmed via software language. Software language is more convenient for the user to understand. From this review we come to know that there is a need of improvement for home automation. Raspberry Pi 3 module is more effective than the previous models. Various features like LAN cable, Ethernet cable, RAM memory, cache memory monitor etc. the facilities which are available in raspberry Pi 3.

There is the need of home automation for the development of smart cities as the world is growing for the development of smart city. The circuits made are cheap, cost effective and work efficient. In this literature survey review, we have seen various models of raspberry Pi via Wi-Fi, raspberry Pi via router, raspberry Pi via Android. All the models are efficient to use and cheaper and convenient as ease of use.

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