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Review On Home Security System

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***Abstract*—**In the present days, there is a growing interest in smart home as a way to offer a convenient, comfortable, and safe residential environment. With the use of Internet and its applications, there is much potential and scope for remote access and control and monitoring of such network enabled appliances. This paper deals with discussion of different intelligent home automation systems and technologies from a various features standpoint.The main attraction of any automated system is reducing human labor, effort, time and errors due to human negligence.This paper present a survey on all such system.

Keywords- *Internet of Things (IOT), Raspberry-Pi, Wireless Door Control, PIR Sensor.*

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I. INTRODUCTION

In recent years, many thinks are happened in our daily life related to home security like robbery, unwanted entrance happened,stealing. So, security issues have grown so dramatically that need to control and secure residential and commercial area.

The concept of home automation has been around since the late 1970s. But with the time people's expectations have changed a lot towards the simple house into smart house. They want smart home do many services automatically. So then this idea become a home automation system.

In fairlyyear's automated control of building system was found only in larger commercial buildings and expensive homes. This system only involve control of lighting, heating and cooling system. But with the use of 'Internet' in the last few years, we want every equipment of house is automatically controlled. Now a days it is also possible to interface human to internet. Also voice controlled home automation system is possible. Using this new controlling system we can achieve home automation very simplicity.

Earlier home automation system designed were controlled by home computer. Today's home automation system are controlled by smartphone, user friendly app that can be accessed by internet or tablet.

After study of many different review papers based on home automation then review of different research paper is done on the basis of which literature survey of different technique used for automation with their advantages and limitations are discussed.

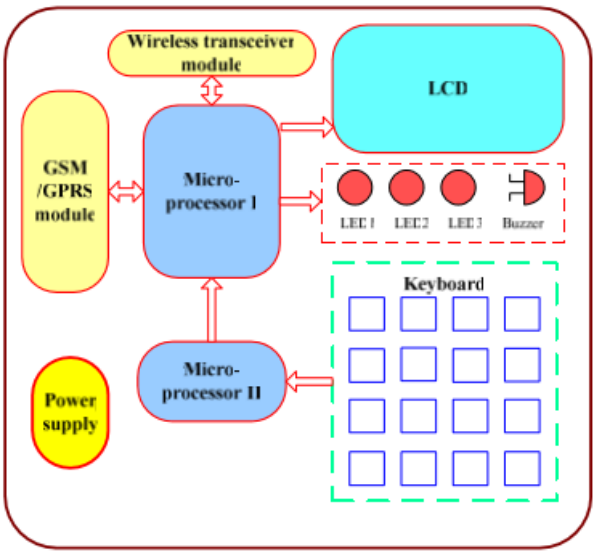
II. LITERATURE SURVEY

1. A LOW COST GSM/GPRS BASED WIRELESS HOME SECURITY SYSTEM

This system is a wireless home network which contains a GSM/GPRS gateway and three kinds of wireless security sensor nodes that are door security nodes, infrared security nodes and fire alarm nodes. This nodes are easy installing.

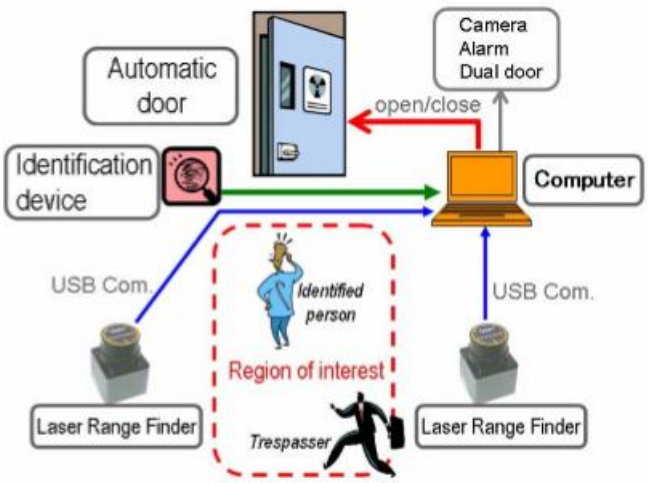
GSM/GPRS is more convenient than internet. The GSM/GPRS network has wide spread coverage making the whole system available for almost all the time. Furthermore, GSM/GPRS network has high security infrastructure which makes sure that the information sent or received cannot be monitored. This system includes two parts: wireless security sensor nodes and a GSM/GPRS gateway.

In figure shows the GSM/GPRS gateway diagram the work of Yanbo Zhao and Zhaohui Ye. This system includes two parts: wireless security sensor nodes and a GSM/GPRS gateway. The GSM/GPRS module is the interface between the gateway and the GSM/GPRS network. Microprocessor I is the central device of the gateway. It receives the information coming from nodes and sends out alarm messages to remote users via GSM/GPRS module. Microprocessor II deals with the keys' signals and sends the signals to microprocessor I through its SPI interface. In this system, the communications between the GSM/GPRS module and Microprocessor I are implemented in the form of AT (Attention) commands.



2. Security Door System Using Human Tracking Method with Laser Range Finders

This system propose a method to track and count people with Laser Range Finders. Multi-target model and Kalman filter based estimation are employed to track the human movement and count the number of people. The proposed method is applied to a novel system to monitor the entrance area and to filter out the trespasser who enters the door without identification. Zhao et al. proposed a method to track people with Laser Range Finders scanning the human feet in indoor environment [9, 10]. Lee et al. investigated a Kalman filtering based algorithm to track walking people using a robot in motion with Laser Range Finder which scans the human legs. Most of previous researches were focused on a method to track moving humans using Laser Range Finders.



Above Fig. shows the architecture of the proposed system which consists of automatic door, identification device, two Laser Range Finders, and main computer. The main computer receives the scanning data from the two sensors and the personal data for identification process from the identification device. Besides, it could be also used to monitor the region of interest, control the door, capture the image around the door, and make alarm in the case of emergency. Generally, security door just consists of ID check device and automatic door. Well-known method to use that door is firstly to check ID and then step in the door if certificated. RFID or fingerprint recognition is usual certification method. However, there are additional components in the proposed system such as Laser Range Finders. They scan the surrounding of door and detect people who pass through door.

If a person who enters the door is certificated with his RFID card and inputs the number of people entering together, then the system counts the number of people in the region of interest and checks whether both numbers are the same or not. If the input number is coincident with the count number from the system, the door will be opened. While they pass through the door, the system monitors whether any trespasser without certification comes in together or not. The system will alarm or take a picture to save the scene in the case that any trespasser exists in the region of interest.

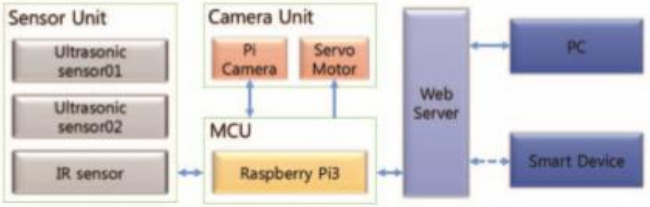
3. Zigbee-GSM based home security system

The system based on Zigbee sensor networks are used to make home networks more intelligent and automatic. In ZigBee technology an end node, the node sends data to the coordinator, and the coordinator Hub sends the data back to the terminal end of the loop. Since all devices have their own IP Address based on IPv6, they can be directly connected to an external network. So, all smart devices it can not only through the handheld remote control device to the central and local home, but can also be controlled remote computer control through the introduction of home Internet Gateway machine.

The Zigbee performance is record and store by network coordinators. For this Wi-Fi is required. The Zigbee requiredlow data rate, low power consumption, low cost, security and reliability. Zigbee is used in several field like medical, industry automation, home automation Vital Monitoring includes Heart-rate Monitoring Body heat Monitoring Personal equipment, control Consumer Electronic include Remote control PC- peripheral Control of windows roll/shades etc. Dimmer/ switches Alarm And security system include Smoke detector Water leakage alarm. The wireless range of Zigbee is good enough for home automation. The range of Zigbee is100to300feetapprox. The overall system cost is very low as compare to other.

4. Raspberry-pi based home security system

Main feature of raspberry pi is that it has very small size. Basically raspberry pi is a minicomputer type where when can connect many input and output devices.



Above fig shows the architecture of home security system using raspberry pi. In this system two ultrasonic sensors, IR sensor and camera, motor are interfaced with the raspberry pi. When this system starts first it initializes the IR sensor and two ultrasonic sensors. When a visitor is detected then two ultrasonic sensors spot the location of that visitor. And then the camera will move towards that direction using servo motor. The system control the servo motor by supplying PWM current. The system stores the recorded video and sensor data in database. The saved data can be seen any remote location via internet.

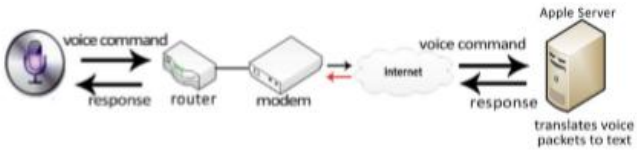
5. Cloud Based home automation system

Home Automation using cloud based system focuses on design and implementation of home gateway to collect data about data from home appliances and then send to the cloud-based data server to get store on Hadoop Distributed File System, it is process using MapReduce and use to implement a monitoring tasks to Remote user Presently home Automation System is persistently developing its resilience by assimilating the current characteristics which gratify the rising interest of the people. The cloud based home

automation system consists of three important units: the first part is cloud server, handle and controls the data and information of client and users and the status of devices. The hardware interface module is the second part which implement the relevant connection to the actuators and sensing devices which give the physical service. Last part is Home Server, which construct the hardware device and gives the user interface.

6. Home security system using siri enabled mobile device

Home automation is a system that has the technology to control devices automatically in order to convene the desires of security, comfort and efficiency. On the other hand, voice-based digital assistant such as Apple's Siri provides a location independent access to the Internet and local networks.



Siri application of a mobile device will generate voice packets from the user and will be sent to the apple server (guzzoni.apple.com) for text translation and process response corresponding to the request. Speech recognition is done through an apple server. In order for the home automation system to use the capability of speech recognition of Siri application, a proxy server must be used in order for translated voice commands to be directed to the control system that will enable home devices. The Raspberry Pi's network and DNS settings, using the Raspbian operating system, were configured in order to connect to Siri-enabled mobile devices. The system was able to automate the five appliances inside the room.The system was able to automate the air cooler to turn off and on; the air cooler to adjust the temperature; opening and closing of the blinds and the door; turning on and off of the lights. And finally, the system successfully operated the TV to turn off and on, change channels, and adjust the volume. The system is fully functional and controlled through the use of wireless fidelity with an overall success rate of 93.3333% at an average of 2.12s latency.

III. CONCLUSION

Survey of different home automation system paper shows that there are various kind of methods to implement home security system. The proposed system of home security which have been presented in this paper have some merits and demerits. This paper explain different home automation system eg. Zigbee, Raspberry-pi,siri, cloud based, GSM/GPRS, Human tracking. Apart from this technique there are also many technique present to control the home security issue. Due to use of this system home automation system will become so easy. Using such kind of system our daily life will become so easier and also due to these system energy is also saved.

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