

IOT based Application for smart city Implementation

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Abstract: *Mobile Phones are the important part of our day-to-day life from last few years. Consequently, providing facilities and security are becoming important mobile devices. In this paper, we have to build a home automation system that alloy with Android mobile devices. The mobile device and system can communicate with each other from long-range via Wi-Fi. The mobile application can be loaded and consolidate with system from any compatible device. Commands to ON/OFF electrical equipment like lights, fans, air conditioners etc at home or any organization can be transfer easily and quickly from the mobile devices via a simple and comfortable GUI application, which is easy to use for the any normal users. The system then acts and respond to these commands by taking actions per commands and gives the result to the user. The user can also see the result on Android mobile application from anywhere. Therefore, it's a good choice to design a home automation for luxurious life. This paper proposes automatic detection of human and Energy saving room architecture to reduce standby power consumption and to make the room easily controllable with an IR remote control of a home appliance. The remote appliances control system based on the Android smart phone GUI is designed on Android Smartphone. A user logs into the smart Android phone interface, and clicks the buttons gently to send message commands from the GUI which will be transmitted to home information center through the GSM network. Then the AVR ATmega processor recognizes the specified command, and controls the home appliance switches in the wireless radio frequency manner to achieve remote control of appliances ultimately.*

Keywords: *Android Mobile Phone, Wi-Fi, Microcontroller, wireless switch, SDK, LPC2148 (ARM7), Embedded 'C', Flash magic.*

I. INTRODUCTION

Generally in urban and confidential region companies, offices most of the people are not interested to switch OFF the consumer electronic appliances like fan, light etc, if they are not present. As more and more consumer electronic and home appliances are expand and the size of them is becoming large, power expenditure in home area tends to grow. Moreover, useless power consumption exist when they do not perform the primary function. Although much effort is made to reduce the standby power of consumer devices themselves, efficient power management schemes over a room or home region are greatly required to minimize the total power consumption in home. The controlling and power monitoring capability is indispensable to home power management. The network capability is also required to communicate one another. In this paper, we develop a remote-controllable Automatic detection of human and Energy saving room architecture. To realize our proposed room architecture, ZigBee as wireless network is used to send the control information Here we proposed a new technology, so that mobile phones can be used to communicate with and control electrical switches like Fans, A.C., Lights etc using Android App Wi-Fi module. The transmitter of Wi-Fi transmits the data given by the application using radio waves technology. The Wi-Fi works on radio waves technology, as the data to be passed through Wi-Fi is converted into the electromagnetic signal which is then sent using the antenna. In future, we can use router for a wide range access like for the Smart City projects. New appliances can be added anytime to the system, which provides for the reliability of the system. Google Exhibit a sneak preview of its Android Home project, which will extend the Android platform into ordinary objects. It means that the remote control based on

Android phone will become a dominant way. After logging into the control interface, users can easily control the lights, TVs and air conditionings anytime, anywhere, which brings great convenience to people and improves the quality of life.

II. LITERATURE SURVEY

Design and Realization of Home Appliances Control System Based on The Android Smartphone present the information about the remote appliances control system based on the Android smart phone is designed and realized. A user logs into the smart phone interface, and clicks the buttons gently to send message commands which will be transmitted to home information Centre through the GSM network. Then the PIC processor recognizes the specified command, and controls the home appliance switches in the wireless radio frequency manner to achieve remote control of appliances ultimately. Exploiting Bluetooth on android mobile devices for home security application present the information about mobile device has been integrated into our everyday life. Home automation and security are becoming increasingly prominent features on mobile devices the mobile device and security system communicates via Bluetooth because a short-range-only communication system was desired. With the help of android mobile we can control task such as locking the doors, turning on/off lights remotely. According to kaue, home automation can be useful to those who need to access home appliances while away from their home and can improve the lives of the disabled Disabled people are more likely to be exposed to daily life problems than other healthy people. While deaf people cannot hear the door bell, Alzheimer diseased people can forget the gas open in the kitchen. These are some encountered examples when they 4 are alone at home. With the help of technology, assistant projects can be developed to overcome their difficulties. Smart homes can also be used to support disabled people, providing safe, secure and empowering environments. The system can allow the user to control many features or automate them. The environment can also be monitored by the smart home system to ensure safety and alert people when there is some dangerous situation.

III. RELATED WORK

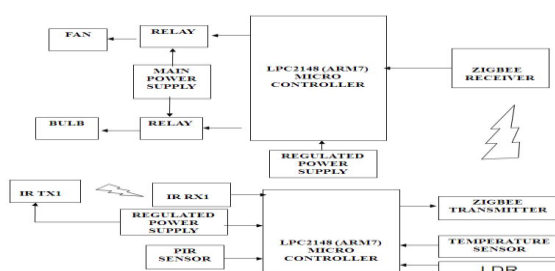


Fig.1 Block diagram of the Automatic Detection of Human and Energy saving system using zigbee.

The Automatic expose of human and Energy saving design is split in to two sub systems (1)Transmitting section and (2) Receiving section. Chinnam Sujana et al. / International Journal on Computer Science and Engineering (IJCSE) I The transmitting section consists of (1) Zigbee transmitter (2) LPC2148 (ARM7) Microcontroller, (3)Temperature Sensor (LM35) (4) IR Transmitter-Receiver (5) PIR Sensor(D203B) The receiving section consists of (1) LPC2148 (ARM7) Microcontroller (2) Zigbee receiver (3) Consumer electronic devices. Fig.1 shows the Block diagram of the Automatic detection of human and Energy saving system using zigbee The IR signal and PIR sensor signals are connected to the transmitter side arm7 microcontroller I/O ports to P1.16 and P1.17 respectively. Calculated temperature value and Light intensity value are given to ADC1.1& ADC1.2 respectively. Zigbee transmitter is connected to pin 19 of ar rm7 microcontroller on TX side. Light and fan are connected to the receiver side arm7 microcontroller I/O ports to P0.11 and P01.12 respectively. Zigbee receiver is connected to pin 17 of ar rm7 microcontroller on Rx side. When a person enters the room, the IR signal immediately followed by PIR signal is formed. Then count should be incremented. When no person is present in the room (i.e., count=0) then send commands to receiver to switch off light and fan. When person is present (i.e., count>0).

IV. PROPOSED SYSTEM

Fig 2 illustrates the overall control function of the system. The projected system works using the smart phone Android application , which is the main source for giving the instruction to the Wi-Fi module.

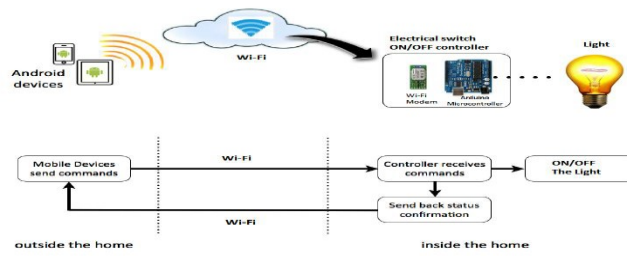


Fig. 2: System Architecture

In this proposed system, From user side, user can choose the option, which switch he/ she wants to ON/OFF from their Android smart phone App. This command goes to the Wi-Fi module. Wi-Fi modules transmitter convert it into signals and send that command to the receiver of the microcontroller. After that controller prompt that particular I/O pin on the board and send input to the communicate. In that Relay, which has already 230V power supply , after receiving current it forms electromagnetic field in coil and passes the 12V current to switch ON the light. User can choose the option from anywhere in remote access area network, which is near about 100 m from Wi-Fi module . It forms HIGH frequency i.e. 0 for switch ON and LOW frequency i.e.1 for switch OFF the electrical supply.

A. Android application :

Android is an Operating System for smart phone devices on which we can run our application. . Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. To design our system we use Android latest version 5.0.2 , also named as lollipop, which supports Application of our system without creating any problem. It is a design with increased use of grid-based layouts, responsive animations and transitions, padding, depth effects such as lighting and shadows. It provides some major new platform features for developers, with over 5,000 new APIs added for use by applications.



Fig 3: Android App

B. Human Detection

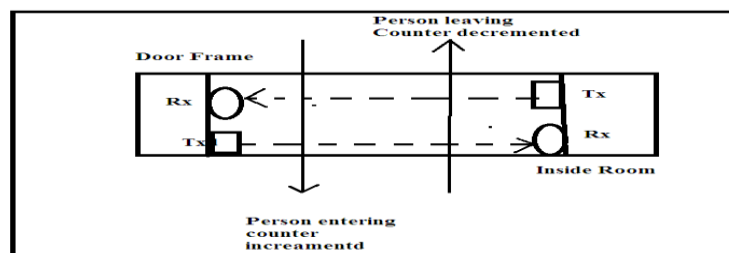


Fig 4: Human Detection

This system is designed to switch the home appliances (room lights in this case) on when a person enters in and leaves out of his room. The system also counts the number of persons entering and leaving the room and displays that information. The ultimate objective of this system is to save the energy as well as to design automatic room light controller by turning off all the appliances when nobody is there in the home. When a person enter in room counter automatically incremented .when person leaves room and

forget to switch off light then after 10 minutes light automatically switch off. Electricity has always remained a prime necessity of life as it is impossible to imagine our life without electricity. But the only problem, as far as electricity is concerned, is the cost at which it is generated – that is crossing all limits by every passing day, and thus putting undue burden on the consumers in the form of higher electricity bills.

This system possesses sets of sensors to detect the persons entering and leaving the room. The LED emits light generated by the timer circuit at some specific frequency. This frequency is detected by the sensor that gives logical signals to the microcontroller. The microcontroller is programmed in such a way that for every pulse that enters the sensor, it increments the counter, and for the exit sensor signal, it decrements the count. Both such counts are displayed on the display. After receiving the pulse signal from the sensor, the microcontroller switches loads by using relay. This relay coil gets energized and de-energized based on the pulses from the microcontroller such that the load is switched only in case of a person's availability. The sensor range can also be extended based on the application usage.

CONCLUSION AND FUTURE WORK

By designing the Android user interface and Home information centre, home appliance control system based on the Android phone can be designed. It has combined android client, network transmission, and wireless switch, home information center to form a complete system, and the whole system works normally. Identifying message commands and wireless encoding are the two major tasks for home information center. Android phone have advantages such as humane interface, customizable and extendible applications and android phone is easy to carry so on. By constantly improving the control function, android phone allows us anytime, anywhere to control any device, and finally realizes the highly intelligent home. In this paper presenting a new system is design. By using Android application via Wi-Fi electronic switch like Lights, Fans, A.C etc ON/OFF control system can be designed. We proposed Automatic detection of human and Energy saving room architecture based on Zigbee Communication. With the help of this architecture, we can control the power when a person enters in the room and exit the room automatically along with we considered additional requirements also. This can be extended to more number of consumer electronic and home appliances also.

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