COMPUTATION OF CLIENT ENTRY AND EXIT USING IOT TECHNOLOGY

Kavithasudha.R(Sr.G)[1], Pranavi.D.N[2], V.S.Smitha[3], S.Aswathi[4], Rajasree.K[5]
Assitant Professor[1], Final Year U.G Student[2,3,4,5]
Department of ECE, SRM Institute of Technology, Chennai.

ABSTRACT
This paper is based on the Embedded technology in the IOT domain. In this project, we have implemented efficient and quick computation of the number of personnel making an entry and exit into any organization/institute. The information computed is sent using WIFI/LAN to the linked host. An automation system which works according to the sensed count is implemented. In addition to this any change detected in the surroundings i.e. due to gas leakage or sudden fire outburst, will be detected and followed by a buzzer/alarm. This design of the system is simple and systematic.

Keywords- ***IOT(Internet of things), WIFI(Wireless fidelity), LAN(Local Area Network).***

INTRODUCTION

Internet of things(IOT) is one of the most preferred technologies in the recent times. Raspberry pi3 is used in this project set-up. Various sensors are used to detect the position and motion of the client. In Raspberry pi2 peripherals like camera and WIFI/LAN were incorporated externally, whereas in Raspberry pi3 these peripherals are inbuilt. Additionally, LCD and servo motor are also used.

The main advantage of this IOT based computation system is to maintain overall security in the organization/institute. This system can be used in various public places where high level of security needs to be ensured.

EMBEDDED TECHNOLOGY

A Dedicated computer system is called an Embedded technology. They control a lot of common devices in todays daily life. They have advantages such as low power consumption, low power unit cost, small size and several operating ranges. Nowadays embedded systems are often based on microcontrollers but ordinary microprocessors are also used.

Complexity varies from low to high, for example a single microcontroller chip which has low complexity or peripherals and networks in a large enclosures which have extremely high complexity. The program instructions written for embedded systems are called firmware. These are stored in read only memory or flash memory chips and have the ability to run with limited computer hardware resources such as little memory, small or non-existent keyboard or screen. Embedded debugging can be done at numerous levels i.e., Interactive resident debugging, External debugging, In-circuit emulator(ICE), etc.

IOT(INTERNET OF THINGS)

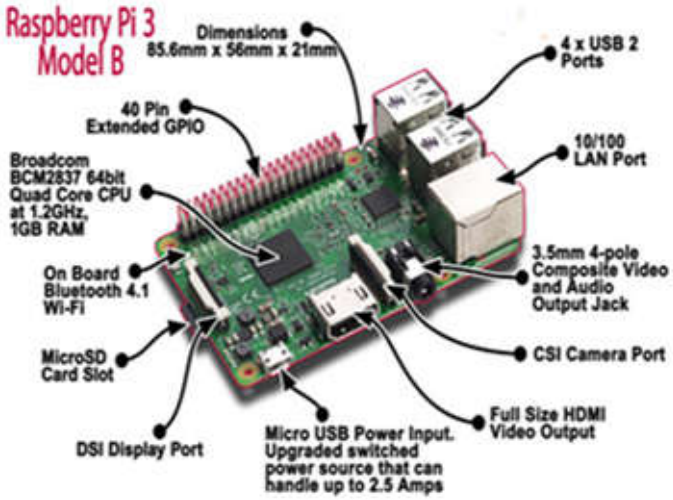
Internet of things is a concept which describes the idea of various physical objects being connected to the internet and being able to identify themselves to other devices. In this communication occurs between physical objects and other internet enabled devices and systems. IOT extends internet connectivity beyond traditional devices like desktop and laptop to a diverse range of devices and everyday things that utilize embedded technology to communicate and interact with external environment all via the internet. IOT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention .The ability to network embedded devices with limited CPU, memory and power resources means that IOT finds applications in nearly every field. There are seven crucial characteristics of IoT. Namely connectivity (network/internet), things (sensors/devices), data, communication, intelligence(analytics), action(decision/automation), ecosystem(platform).

RASPBERRY PI3

Raspberry pi3 Model B is a single board computer with wireless LAN and Bluetooth connectivity.It is used for many units and so it's called as “general purpose computer”.Processor speed of Raspberry pi ranges from 700MHz to 1.2GHz.Secured digital (SD) cards are used to store the operating system and program memory.On board memory ranges of Raspberry pi is between 256MB to 1GB RAM.HDMI and composite video for video output are supported in this system. The B-models have an 8P8C Ethernet port. The Raspberry pi 3 uses a Broad com BCM2837 SoC with a 1.2GHz 64-bit quad-core ARM Cortex-A53 processor with 512 KB. The performance of Raspberry pi3 with a quad core ARM Cortex-A53 processor is described as 10 times the performance of a Raspberry pi1 and so it is to be highly dependent on task threading and instruction set use.

The peripherals of Raspberry pi is operated with any generic USB computer keyboard and mouse. Other peripherals can be attached through the various pins and connectors on the surface of Raspberry pi. The video controller can generate standard modern TV resolutions ,such as HD and Full HD higher or lower monitor resolutions as well as older NTSC or PAL standard CRT TV resolutions.

Raspberry pi3 is preferred over Raspberry pi2 because of its various advantages. Raspberry pi3 has WIFI and Bluetooth facility, whereas in Raspberry pi2 USB adapters are required to add the same. Raspberry pi3 takes over its predecessors with a new fast and efficient processor on board. It is best used when you require a single device to perform multiple tasks and complex calculations simultaneously. In other words, it is called a' Mini Computer'. It is best suited for applications which are server based.



The organization behind the Raspberry pi consists if two arms. The first two models were developed by the Raspberry pi foundation. The storage purpose of a Raspberry pi3 is fulfilled by a Micro SDHC slot and the memory space is about 1 GB at 900 MHz. The average power when idle is 1.5W and ranges to 6.7 W when at maximum under stress. Hence, the Raspberry pi 3 is equivalent to a mini CPU which acts as a "compute model" for various computation purposes.

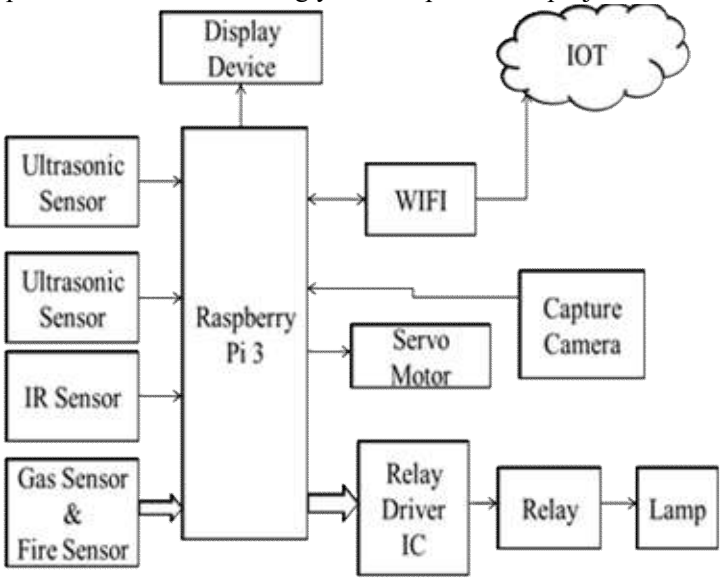
EXISTING SYSTEM

In the existing system RFID and Bluetooth are used for wireless communication between the client and host. The unit consists of Controller, RFID module, Bluetooth and LCD. This proved to be useful only for the purpose of computing attendance in any school/college/organization. The main disadvantage is that one person can scan the RFID of another which in turn marks the latter present. In some cases, the person might misplace or forget to carry the RFID card. The camera that are employed in other existing models are fixed ones with several blind spots. This poses lot of ambiguity to the host.

PROPOSED SYSTEM

In the proposed system, Embedded technology coupled with Internet of things (IOT) has been used for computation of client entry and exit. We have used two Ultrasonic sensors to locate the position of the client. An IR sensor is used for client detection and Raspberry pi3 is used as controller. The camera module is equipped with the servo motor to change the direction as well as to minimize the blind spots which was a major drawback in the existing system which uses fixed cameras. The information stored in the web server is transmitted to the linked host through mail or mms via WIFI/LAN. In addition to the computation our project has various other applications. Firstly, an Automation system which works based on the density of people who entered the room, depending upon the number of entries the required number of electrical appliances such as light, fan, etc, will be turned on. This will help to reduce unnecessary wastage of electricity. Secondly, any changes in chemical composition of the surrounding will trigger an alarm/buzzer indicating gas leakage. Lastly, any sudden and unexpected fire outburst will be detected and people will be alerted with an alarm. The last two applications are mainly to ensure the safety of people within the organization/institute.

The Block Diagram for the proposed system is given below which contains all the peripherals attached to it and connections for different peripherals are made accordingly with respect to the project.



COMPONETS REQUIREMENTS

Several hardware and software components have been used in this project:

IR SENSOR The principle behind infrared automatic object sensors is the transmission and reception of infrared light.

An element known as a Light Emitting Diode (LED) transmits active infrared light, which is reflected on the floor and received by optical power known as Photo diode, As long as there is no movement or object in the path of the light beam, the light pattern is static and sensor remains on stand-by. When a person or object crosses the beam the reflection of the light is distorted, This is registered by the Photo diode, which gives off an impulse. IR sensors are broadly classified into two types Thermal infrared sensors use infrared energy as heat and quantum infrared sensors provide higher detection performance and faster performance speed.

ULTRASONIC SENSOR It sends out a high frequency sound pulse and then times how long it takes for the echo of the sound to reflect back. The sensor has two openings on its front. One opening transmits ultrasonic waves, the other receives them.

SERVO MOTOR. It is controlled by sending an electrical pulse of variable width or Pulse Width Modulation through the control wire. There is a minimum pulse and a maximum pulse and a repetition rate. There are two types of servo motor AC and DC. Ac can handle higher current surges and tend to be used in industrial machinery. DC servos are not designed for high current surges and are usually better suited for smaller applications.

PYTHON It is a high-level programming language for general-purpose programming. The latest version of Python. version 3 has been used for implementation of this project.

CONCLUSION

We have proposed an IOT based Computation system for the client entry and exit using the various sensors to detect the count. Also, additional features such as Chemical composition changes in the surroundings (gas leakage), Temperature changes in the surroundings (fire outburst), Automation of electrical appliances (fan, light) according to the number of count detected will be automated.

Hence, this project is basically a general security based device which enables us to get the exact number of count and a clear image captured by a camera and stored for future purposes.

REFERENCES

The Design and Implementation of a teacher-student Interaction Between Zigbee And Rfid ,2011 IEEE Jiang Ting, Zhao Chenglin. Wireless sensor network technology and its application. Beijing: Beijing University of Posts and Telecommunications.

Ye-Jin Jang, Young-Tae Chun, "Technology trend of Smart-home Security System", Korean Security Science Review, 2012.

Il-Sik Chang, Hyun-Hee Cha, Goo-Man Park, Kwang-Jik Lee, "A study of Scenario and Trends in Intelligent Surveillance Camera", The Journal of The Korea Institute of Intelligent sTransport Systems, August 2009.

V S Rakesh, P R Sreesh, Sudhish N George, "An improved real-time surveillance system for home security system using BeagleBoard SBC, Zigbee and FTP webserver", IEEE Conference Publications, 2012.