IOT Based Home Automation Using Android

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Abstract:

This paper is based on wireless sensor network for home automation using Wi-Fi automate the home .In order to use low power and low cost for the solution of automating the home using Wi-Fi and Zigbee technology. A prototype automation system for monitoring and controlling in home with embedded nodes and controlling nodes has been developed and tested in home. The system consists of sensor nodes, actuators nodes, router nodes, and one coordinator node.WSN is very helpful to implement the home automation system. Inside the home we have lot of electronic equipment to make our job easy. Here in this paper we implement the home automation system to advance the manual monitoring.

Key words:

Home Automation, Wi-Fi.

I.   INTRODUCTION:

Smart Home can be also known as Automated Home or intelligent home which indicates the automation of daily tasks with electrical appliances used in homes. This could be the control of lights, fans, viewing of the house interiors for surveillance purposes or giving the alarm alteration or indication in case of gas leakage. Home security has changed a lot from the last century and will be changing in coming years. Security is an important aspect or feature in the smart home applications.

Here things are the sensors, the sensor data accessed, monitored and controlled through internet from anywhere, anyplace, any time and any device is called internet of things. IoT finds applications in all automation industries. Mostly considered research area is home automation.
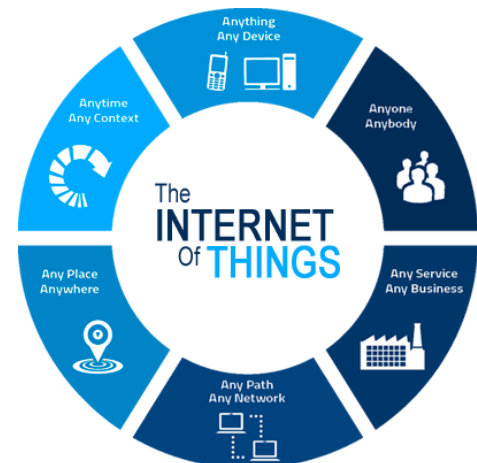
Fig 1: exploration of IoT

The new and emerging concept of smart homes offers a comfortable, convenient, and safe environment for occupants. Conventional security systems keep homeowners, and their property, safe from intruders by giving the indication in terms of alarm. However, a smart home security system offers many more benefits. This paper mainly focuses on the security of a home when the user is away from the place. Two systems are proposed, one is based on WI-FI technology and other uses web camera to detect the intruder., installed in house premises, which is

operated by software installed on the PC and it uses Internet for communication.
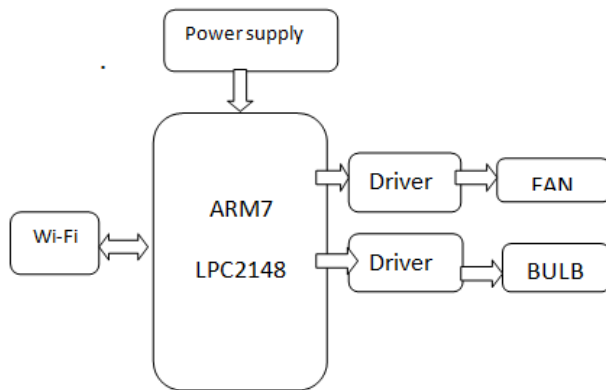
Fig: block diagram smart home

The software communicates to the intended user via Internet network and at the same time it gives sound alert. The proposed system is aimed at the security of Home against Intruders and Fire. In any of the above cases happens while the owners are out of their home then the device sends sms to the emergency number which is provided to the system. The system is made up of three components: sensors, WI-FI Module, raspberry pi, relays to control the device and buzzers to give security alert signal in terms of sound and also 3 algorithms are used in the system:

II. Design and Implementation:

The implementation of the proposed system is show in above fig Wireless Sensor Network (WSN) for home automation system consists of consists of two main parts: embedded network, controlling and monitoring. Control and Monitoring Network consist Wi-Fi router, actuators node. Wi-Fi router it communicates with microcontroller through serial communication port and it communicates with pc Wi-Fi network wirelessly. Actuator nodes consist of electrical appliance like light, fan etc .turning on and off of these appliances is done by internet by communicating with server Wi-Fi router and as well as user can get the status of all the appliances in the actuator node embedded Network consist of several appliances like light Fan etc,.

The embedded nodes have the function to monitor the building conditions.

III. SYSTEM HARDWARE:

LPC2148 Processor:

LPC2148 Microcontroller Architecture. The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption. The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro programmed Complex Instruction Set Computers (CISC). This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core. Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Typically, while one instruction is being executed, its successor is being decoded, and a third instruction is being fetched from memory. The ARM7TDMI-S processor also employs a unique architectural strategy known as Thumb, which makes it ideally suited to high-volume applications with memory restrictions, or applications where code density is an issue.The key idea behind Thumb is that of a super-reduced instruction set. Essentially, the ARM7TDMI-S processor has two instruction sets:

• The standard 32-bit ARM set.
• A 16-bit Thumb set.

The Thumb set's 16-bit instruction length allows it to approach twice the density of standard ARM code while retaining most of the ARM's performance advantage over a traditional 16-bit processor using 16-bit registers. This is possible because Thumb code operates on the same 32-bit register set as ARM code. Thumb code is able to provide up to 65% of the code size of ARM, and 160% of the performance of an equivalent ARM processor connected to a 16-bit memory system.

- Standard 32-bit ARMv5TE set
- 16-bit THUMB set

Relay:

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits, the link is magnetic and mechanical. Relays are very simple devices. There are four major parts in every realy.

They are

- Electromagnet
- Armature that can be attracted by the electromagnet
- Spring
- Set of electrical contacts

DC Motor:

DC motors are configured in many types and sizes, including brush less, servo, and gear motor types. A motor consists of a rotor and a permanent magnetic field stator. The magnetic field is maintained using either permanent magnets or electromagnetic windings..Motors are the devices that provide the actual speed and torque in a drive system. This family includes AC motor types (single and multiphase motors, universal, servo motors, induction, synchronous, and gear motor) and DC motors (brush less, servo motor, and gear motor) as well as linear, stepper and air motors, and motor contactors and starters.

FEATURES:

• The PB series are high-performance buzzers with a unimorph piezoelectric ceramic element and an integral self-excitation oscillator circuit.

• They exhibit extremely low power consumption in comparison to electromagnetic units.
• They are constructed without switching contacts to ensure long life and no electrical noise. Compact, yet produces high acoustic output with minimal voltage.

IV. Conclusion:

In the paper low cost, secure, ubiquitously accessible, auto-configurable, remotely controlled solution for automation of homes has been introduced. In this paper, Wireless sensor network are used to control and monitor the electrical appliances. The widely-used indoor wireless technologies include Bluetooth, WI-Fi and Zigbee. Wi-Fi and Bluetooth are short range in home wireless technologies with high data rate transmission. The home automation system Synco living allows you to control your lights, heating, ventilation, and air conditioning, conveniently switch electrical appliances on and off, and monitor the rooms of your consumption data.

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