Second International Conference on Nexgen Technologies
Sengunthar Engineering College, Tiruchengode, Namakkal Dist. Tamilnadu (India)
8th - 9th March 2019 www.conferenceworld.in ISBN : 978-93-87793-75-0

SMART HOME MONITORING AND CONTROL SYSTEM BASED ON IoT

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ABSTRACT:
Now-a-days the technology increasing rapidly that leads to an upgradation in home security system. A standard alone system Internet of Things as a network of communication is implemented. An availability of low-cost sensors and ubiquity of wireless networking technologies is charging the landscape of how least three ways in which consumers will interact with their smart homes in the future; Tangibly interacting with objects in the home through touch or by sitting on, by communicating with objects within the home using voice commands, and by using body gestures. The server side taking care of computational work where as the client side is taking care of sensor actuator work.this paper presents the design and implementation such a hand-held small wireless device called a sensepod that allows a consumer to use simple gestures systems, this device is to interact with their smart home.
Keywords: Internet of Things (IoT), Arduino kit, temperature sensor, fire sensor, IR Sensor

I. INTRODUCTION:

The Internet of Things has become the hottest topic in technology.IOT is transmission for all terminal device by wide or wireless connection to the internet. By using the sensor control all the terminal device to collector the larger data and information to more application service.The small terminal with low power consumption and Low cost. The wireless system using low power consumption is needed because manganese for a network. The information is transmitted to a using X-Bee network.It is a wireless communication module with data acquisition function and can match with X-Bee products have different models, each as different antenna type function.The X-Bee supports the Zigbee communication protocol. The main features low cost, low speed, low power consumption support for the network technology. The end device is connected to the sensor and control, transmit and receive the data. With the continuous exploration of high quality of life, the requirements of the living environment become more safety, comfort, automation and intelligent. The current environmental monitoring system research is divided into two categories: the first category includes a distributed based on CAN bus and RS-485 bus temperature and humidity environment monitoring system; the second category is wireless, including IOT technology wearable intelligent environment parameter acquisition system. Smart home system refers to the use of advanced computer technology, network communications technology, intelligent control technology, wireless sensor network technology, and combine a variety of home equipment organically to provide people with efficient home environment.

II. LITERATURE SURVEY:

Gill et al. (2009) explains network enabled digital technology is rapidly introduced in the home automation. For the purpose of home automation this technology introduces new and existing opportunities to increase the connectivity of the devices. The remote-control technology is rapidly synchronizing with the expansion of Internet (1).Shetel and Agarwal (2016) explains in their paper that IoT enables internet connectivity for all kind of devices and physical objects in real time system. The virtualization of this system enables to perform activities without direct physical synchronization between the devices. The IoT enables to manage multiple jobs without any limitation of distances

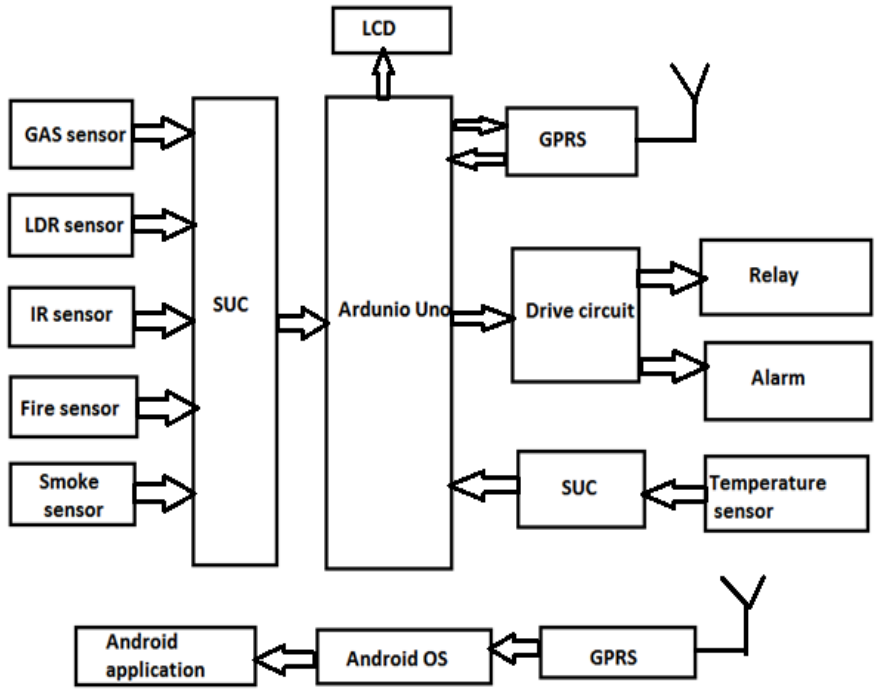
with the help of intelligent devices and high-speed network (2).Lee et al. (2017) explains in their paper the web of physical objects is Internet of Thing which contains the embedded technology helping in developing machine to machine or man to machine communication. This paper provides a dynamic data sheet about the city environment parameters taken from the stand-alone system (3).

III.PROPOSAL METHOD:

For Smart Home monitoring, we are using the technology of IoT with Arduino kit. Low cost IT solution preferably around Internet of the things (IoT) sensor and IoT data integration to existing application software. Arduino is an open source computer hardware and software, manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. It's aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors.

3.1 HARDWARE DESCRIPTION:

3.1.1 Block Diagram:



3.1.2. Fire Detection Sensor:

Fire detection sense one or more of the products or phenomena resulting from fire, such as smoke, heat, infrared and ultraviolet light radiation,or gas.In non domestic buildings,fire detection will typically take the from of fire alarm system.

3.1.3. LDR:

A photo resistor or LIGHT DEPENDENT RESISTOR or cadmium sulfide (CdS) cell is a resistor whose resistance decreases with increasing incident light intensity. It can also be referred to as a photoconductor. A photo resistor is made of a high resistance semiconductor. If light falling on the device is of high enough frequency, photons

absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance.

3.1.4. LPG Gas Detector:

This is a simple to use liquefied petroleum gas LPG sensor, suitable for sensing LPG concentrations in the air. The can detect gas concentrations any where from 200 to 10000ppm.the sensors output is an analog resistance.

3.1. 5. Temperature Sensor:

Temperature sensor is the instrumentation equipments which is used to measure temperature or heat on the operating machine part .Temperature sensing is performed by equipment Thermocouple. A Thermocouple is temperature measuring device consisting of two this similar conductor that contacts each other one or more points.

3.1.6. IR Sensor:

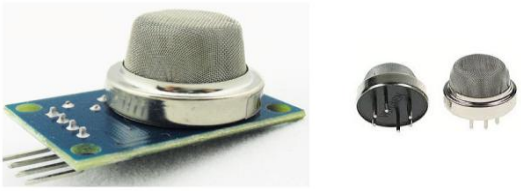
An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings. it does this by either emitting or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitting by an object and detecting motion.

3.1.7. Gas Sensor:

Electrochemical gas sensors are gas detectors that measure the concentration of a target gas by oxidizing or reducing the target gas at an electrode and measuring the resulting current.

3.1.8. Smoke Sensor:

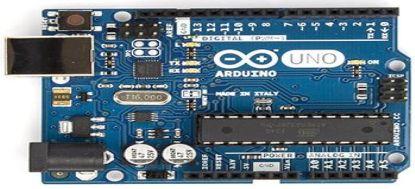
A smoke detector is decivce that senses smoke, typically as an indicator of fire commercial security devices issue a signal to a fire alarm control panel as part of a fire alarm system



3.2 SOFTWARE DESCRIPTION:

3.2.1Arduino Uno:

Arduino/Genuine Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. When something goes wrong, the chip can be replaced for a few dollars and start over again.



IV.CONCLUSIONS

This paper designs and completes an smart home environment monitoring system based on EnOcean technology. The system uses the self-energy EnOcean wireless acquisition unit to the temperature, humidity, light intensity data, and sent to the smart home controller, and then by the controller through the Wi-Fi communication to the server, and

finally through the PC in the browser Real-time monitoring display. The system software part of the B/S architecture, and the use of Tomcat server and the classic MVC model for the overall design.

Compared with the traditional environmental monitoring system, the system has the following advantages: the system is perfect, and the temperature, humidity and illumination data are collected in real time. Secondly, the system shows intuitive, simple operation, less wiring, convenient maintenance and modification which can save the resources and energy.

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