

Security System and Smart Automation using IOT

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Abstract - In this paper we present a security technique and automation systems for home and many other places like school, holy places etc.,. The sensors will be interfaced with Arduino. The status of the appliances will get uploaded to a cloud platform through wireless module. System and mobile should be connected through the same wireless network. Sensors can be controlled by the user. The flex sensor depends upon the gestures of the fingers to control the devices. The magnetic sensor will enhance a door breaking security. All these data can be seen by the user on the cloud platform like THINKSPEAK. This paper explains that how the IoT applications will help us to monitor the things.

KeyWords: Arduino, Flex Sensor, Wireless Module, Flame Sensor, Internet of things (IOT)

1. INTRODUCTION

Today, the increase in demand of the service over the internet makes the data collection and exchange in efficient manner. The internet of things (IOT) has promised the ability to provide the efficient data storage and exchange the data by connecting the physical devices via an electronic sensor and internet. The IOT has created the revolution all over the world and fascinatingly become the integral part of life. This paper utilizes the Arduino fundamentals, and some sensor to ease the way we control our homes appliances. This is achieved by interfacing sensors like flex sensor, accelerometer sensor, fire sensor with microcontroller based system like Arduino UNO.

2. Literature Survey

[1] The main objective of this paper is to face the challenges that occur in Automation system. It is a distributed home automation system, consists of server, sensors. Server controls and monitors the various sensors used and it can be easily configured to handle more hardware interface module. The Intel Galileo development board, with in-built WiFi card to which the card is inserted, acts as web server. Automation System can be accessed from the web browser of any local PC in the LAN using server

IP, or remotely from any PC or mobile handheld device connected to the internet with appropriate web browser through server real Internet Protocol. WiFi technology is selected to be the network infrastructure that connects both the server and sensors. WiFi is chosen to improve the

system security (by using secure WiFi connection), and to increase system mobility and scalability.

[2] In this paper, Android platform is used since it has huge market and open source technology. Android is a software stack for the mobile devices that includes an operating system, middleware and key applications. The Android OS is based on Linux Software. Android Applications are created using Java like language running on a virtual machine called 'Dalvik' created by Google. The Android SDK provides all the tools and APIs which are necessary to develop applications on the Android platform using the Java programming language. An Accessory mode is one of the feature of Android OS since version 2.3.4 Gingerbread and 3.1 Honeycomb and above.

[13] In this paper, the controlling process is done by Atmega644p microcontroller. It collects information from all the sensors, makes a decision and sends the SMS to a corresponding number by using a GSM modem. If it finds any interruption in the sensors, then microcontroller will send an SMS to the owner. In the same way, if the temperature is increased above certain point or gas sensor is ON, a SMS will be sent to the owner 'Fire at home' giving the indication of fire. The LDR (Light Dependent Resistor) is used to sense the light in a room and checks whether the lights will be turned ON or OFF.

3. Components and Software Used

Arduino UNO, 7805 power supply, Relays, Flex Sensor, Fire Sensor, Accelerometer, Wi-Fi Module, Arduino IDE, LDR.

4. Block Diagram

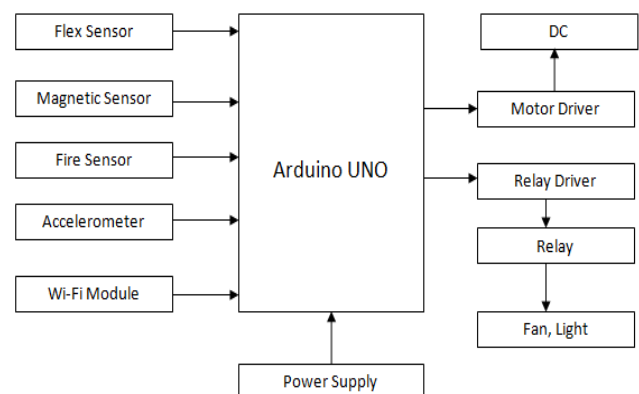
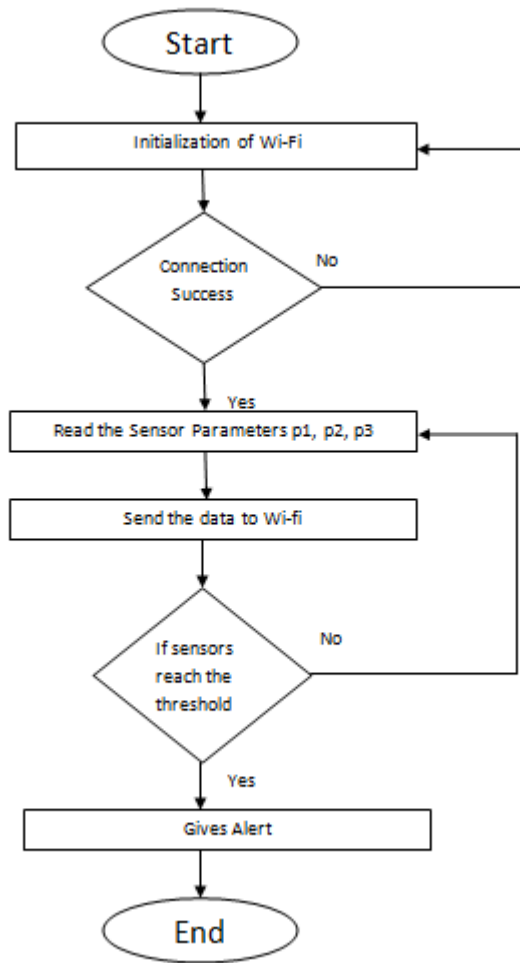


Fig.1 Block Diagram

5. Flow Chart



6. Specification

Arduino UNO Board: A Data processing Board

The Arduino expansion was emerged in 'Italy' to build up a low cost hardware module for communication design. This Arduino Uno is an excellent choice for all the IoT Application design and one can able to design programs according to the needs and able to form interface type circuits to interpret switches and to add sensors, Arduino based microcontrollers provides flexibility and prevails 'one board computer' that endow with an effective way for coding and circuit interface, creating to comprehend switches and diverse type of sensors are managed by the operation of motors and lights. Fewer efforts and the below Fig 2 shows the Arduino UNO that encloses 'ATmega328' and bestows a serial communication.

Arduino UNO has an internal Boot loader that permits the uploading of most recent code devoid of using any type of exterior hardware programmer. The Coding is done by the means of Arduino coding/programming language (APL) that provides 'wiring' and the Arduino development environment (ADE) that tenders 'processing'. Users Entails to connect microcontroller to a 'computer' with a USB cable

or a peripheral 'AC to DC' power adapter or to a 'battery power' that helps to trigger the UNO task and makes it to depart from all previous boards where no use of 'FTDI' USB to serial driver Chip was established.



Fig.2 Arduino UNO Board

Arduino ESP8266: A Wi-Fi Module for IoT

The ESP8266 provides an absolute, self-reliant Wi-Fi networking resolution and it permits to either host the function or to divest every Wi-Fi networking function from a supplementary application processor. As soon as the ESP8266 hosts the function, it is the only 'application processor' in the device to boot up straight-away from an External flash.



Fig.3 Arduino ESP8266

Relay

A simple electromagnetic relay consists of coil of wire wrapped around a soft iron core, an iron yoke which provides a low reluctance path for magnetic flux, a movable iron armature, and one or more sets of contacts. The armature is hinged to yoke and mechanically linked to one or more sets of moving contacts. A relay is an electrically operated switch. Many relays use an electromagnetic device to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used, where it is used to control a circuit by a separate low-power signal or where several circuits must be controlled by one signal.

Flex Sensor

A flex sensor or bend sensor is a sensor that measures the amount of deflection or the amount of bending. This flex sensor is a variable resistor. The resistance of the flex sensor is directly proportion to the body of the component bends. The sensor used in this experiment is to control the light.

Fire Sensor

A fire sensor is a sensor which "senses" a weak DC signal from the AC power sent to the ignitor via the phenomenon of flame rectification in which the polarity of power sent through a flame is rectified as DC. This sensor is used to detect the fire and then send an alert through buzzer.

Accelerometer

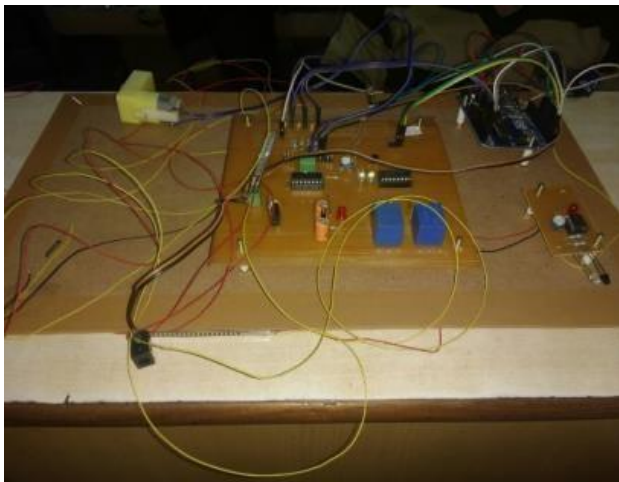
Accelerometers are the devices that measure the value of acceleration, which is the rate of change of velocity of an object. It is measured in terms of meters per second square (m/s^2) or in G-forces (g). The values are labeled as X, Y and Z coordinates. The values are used to control the rotation of motor.

Arduino IDE

The open-source Arduino Software (IDE) makes it easy to write a code and upload it in the board. It runs on Windows, Mac OS X, and Linux Platform. The Program is written in Java and based on Processing and other open-source software is used. It runs on the computer, used to write and upload code in the physical board.

7. Experimental Setup of Automation System

It consists of three important parts i.e. sensing, monitoring, and controlling system. The first part is to sense the sensors like flex sensor, accelerometer etc. the monitoring task is done by the cloud platform and the controlling part is done by the microcontroller unit i.e. is Arduino UNO.



The sensors, devices that are connected and Wi-Fi module are interfaced with Arduino UNO. The value of sensors brings a change in the status of the devices. The flex sensor depends on the gestures of the human fingers to control the devices. The accelerometer controls the opening and closing of the door. The magnetic sensor alerts if the door lock breaks. The flame sensor alerts if there is a fire in the place. The status of the devices is uploaded in the cloud platform and the user can see the status of the sensor in

the laptop and smart phone as well. The Arduino UNO controls the appliances on the basis of threshold value given to the sensors.

8. Conclusion

The IoT gives numerous benefits to the society. In this paper, it proves the strength of IoT that is capable of contributing the services for the purpose of building vast no. of applications. This paper provides moderate and less expensive way of sensing, monitoring and controlling system in the field of domestic and as well as industrial standard to implement IoT.

We conclude that IoT becomes universal in every aspect. This paper will be very beneficial in normal day to day life and will bring much needed innovation in this fast changing world of technology where people prefer to have control over things using the smart phones which will bring ease their routine life.

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