

# SURVEY ON IOT BASED HOME AUTOMATION AND SECURITY

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## ABSTRACT

Internet of things is a combination of Aurdino, sensor, software and other technologies. We can use iot in our daily routine likes home application, communication, security, forensic lab etc..[1]. Iot share information from machine to machine without any human interaction. In Home automation IOT plays a major like automatic switching, open and closing and also in security. It sends the information to owner via the wireless communication like ZigBee, Bluetooth, Wi-Fi etc..[2]. This will help the user to automate where ever they. This will mostly help for the handicap people.

**Keyword:** - Internet of Things, Home Automation, Security, Camera, Arduino uno, Sensor

## 1.INTRODUCTION

Home automation using Iot will enable the user to automate and control the home appliances via the internet .so home automation the method of dominant home appliances mechanically victimization varied system techniques. The electrical and electronic appliances within the home like fan, lights, out of doors lights, fire alarm, room timer, etc., may be management victimization varied control techniques. When the guest arrives the home in the absence of owner, the owner can welcome them by using the home automation. Home automation also includes safety measures if sensors sensed any movement Infront of home it sends the alert message like voice message, email, images etc. A sensor senses the status of appliances and updates to web server [2] and also, we can use the cloud computing for storing information [1]. If any problem arises in home appliances then the user can control them.

## 2. HOME AUTOMATION

Internet of things additionally depend upon the gathering of information. the info is then used for observation, dominant and transferring info to different devices via the web. this enables specific actions to be mechanically activated whenever bound things arise.

Under the house Automation we will management all electrical appliances from long distance through AN mobile. during this project we have a tendency to square measure dominant Lights and Fans through an online. Even though if Wi-Fi isn't offered, we will head to 3G or 4G services to control the system. this can help U.S. to control our home appliances through a protracted distance. this can help the disabled and aged folks to regulate their home appliances simply.[6]



**Fig-1:** Home

Automation

### 2.1 Light on/off

The light may be activated mechanically by the active presence of an individual's body inside the detection vary, once there's no presence the sunshine is going to be deactivated mechanically by the utilization of PIR sensing element. By victimization PIR sensing element we are able to save additional energy. masses emit thermal energy of wavelength around 9-10 micro-meter every day. electrical phenomenon or Passive Infrared Sensor is associate degree device that is intended to notice this IR wavelength once an individual's being is in its proximity. to own a good, vary for detection a straightforward lens is used. Sensors can also be tag in such some way thus on ignore domestic pets by setting the next sensitivity threshold, or by making certain that the ground of the space remains out of focus.

### 2.2 Door Opening / Closing

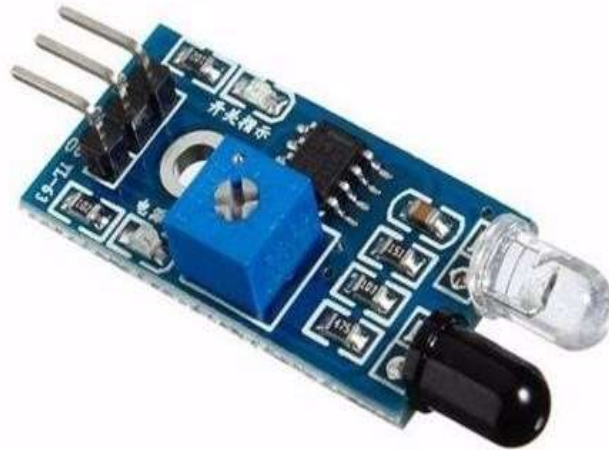
Door sensing device includes two compo nents that is One reed switch with two pins and One magnet. once the magnet is on the brink of the reed switch, the reed switch circuit is closed and once the magnet is way from the reed switch, the reed switch circuit is open.[6] once the PIR device detects any motion of an individual, its information OUT Pin can become HIGH. As this pin is connected to the Arduino, it'll observe this HIGH Signal and understands that there's person approaching the door. Arduino then now activates the Motor Driver module to open the door.

### 2.3 AC On/ Off

The temperature sensors live the part temperature. humidness sensors observe the magnitude relation of the immediate environments throughout that they are placed. They measure the condition and temperature inside the air and express magnitude relation as a share of the relation of moisture inside the air to the utmost amount which is able to be command in the air at this temperature. As air becomes hotter, it holds further condition, so the magnitude relation changes with the temperature.[2]. And send the info to home automation system that controls the heating, ventilation and air-con system within the house.

### 2.4 Fan On/Off

IR device take the High worth once it notices the presence of human and Low once it doesn't detect anyone within the space. Photodiode collects the intensity of sunshine that's gift within the space and supported the formula it switch's the fans by ON & OFF.



**Fig- 2:** Infrared sensor

### 2.5 Air purity checking

The MQ series of gas sensors utilizes a tiny low heater within with associate degree electro chemical detector these sensors are sensitive to range of gasses are used at temperature. When the target explosive gas exists, then the sensor's physical phenomenon increases a lot of increasing a lot of together with the gas concentration rising levels. By victimization straightforward electronic circuits, it converts the charge of physical phenomenon to correspond output signal of gas concentration.

### 3. SECURITY

From a home security perspective, this additionally includes your warning device, and every one of the doors, windows, locks, smoke detectors, police work cameras and the other sensors that square measure coupled thereto.

#### 3.1 Gas Leakage detection

Gas sensors square measure supported the principle of mensuration the amendment within the resistivity of a cloth upon introduction to the target gas. the foremost common form of gas sensing employs a solid-state material because the gas-sensitive element. Gas device can discover gasses like LPG, Alcohol, Propane, Hydrogen, CO and even paraffin. The module version of this device comes with a Digital Pin that makes this device to manage even whereas not a microcontroller and that comes in handy once you unit of measurement only making an attempt to find one specific gas.[6]

#### 3.2 Flame Sensor

A flame-sensor is one quite detector that is especially designed for sleuthing in addition as responding to the prevalence of a fireplace or flame. It includes Associate in Nursing alarm, a gas line, gas & a fireplace suppression system. This device is employed in industrial boilers. the most perform of this is often to administer authentication whether or not the boiler is correctly operating or not. The response of those sensors is quicker in addition as a lot of correct compare with a heat/smoke detector owing to its mechanism whereas sleuthing the flame.

A flame sighter could be a sensing element designed to detect and respond to the presence of a flame or hearth. Responses to a detected flame rely upon the installation, however will embrace sounding an alarm, deactivating a pipe and activating a hearth suppression system.

### 3.3 Antitheft Protection

The LDR detects a modification within the candlepower once the locker/safe is open unauthorizedly and it powers the Arduino board once high candlepower is gift. The board is preprogramed in such how that it sends a message to the owner or authorised person and anxious officers through the GSM electronic equipment that's interfaced serially.

## 4. COMMUNICATION

Here the communication is transferring the data to the owner from the home appliances via the WIFI, ZigBee, Bluetooth,6Lowpan etc. And also, by this the owner can automate the home appliances.



**Fig-3: Communication**

### 4.1 WI-FI

Wi-Fi works off of an analogous principal as completely different wireless devices - it uses radio frequencies to send signals between devices. The radio frequencies square measure fully completely different say from walky talkies, car radios, cell phones, and weather radios. Here, throughout this project Wi-Fi module is used to receive commands from internet and activate a whole lot through TRIAC & Optocoupler by execution a program written at intervals the WiFi module. Hence, no microcontroller is used throughout this project to drive a whole lot [ 3].

### 4.2 Bluetooth

Bluetooth is wireless communication customary that permits electronic devices to attach and move with one another. It will be found in a very variety of gadgets, from smartphones, to loudspeakers, to laptops and a lot of Bluetooth network has restricted vary of ten meters if the smartphone is out of vary, then it'll not be ready to management the house appliances, this is often one amongst the most disadvantages of Bluetooth primarily based home automation system [1].

### 4.3 ZigBee

The ZigBee customary allows wireless two-way communications over up to 20m within a home for management signals. As with any wireless system, vary is tormented by the kind of walls, solid objects, and different sources of

EMI. ZigBee uses a pair of 4GHz frequencies like home WiFi, and for constant smart reasons. However, the various approach within which ZigBee uses these frequencies permits a ZigBee network to co-exist with WiFi networks. Simple ways like maintaining a minimum of 2m between WiFi and ZigBee devices, and a minimum of 30MHz between the channels utilized by every, facilitate any minimize the potential of either.

## 5. LITERATURE REVIEW

In this paper [1] the author experimented, the implemented system's that is connect all the devices with the sensors and the automated home is controlled by the controller. But there is some lacking in the other existing system. The main lacking is in the security portion. The security is a little bit weak in that observed process. In our home automation system, there are huge benefits than the other systems. Our system controls all the instruments of our house through mobile phones or computers. And the control system is simpler than the others. The system we build there is no lacking in security because we improved the security system of our proposed system. Our system is much secure than the others because here we use identical eye retina scan pattern for professed sensor's response which will detect the owner of that home.

In this paper [2] the author experimented, the projected system is enforced victimisation Node MCU by overcoming all the drawbacks of previous existing strategies during this project all the sensors square measure connected to the Node MCU board and therefore the results may be seen in good phone. for each second it shows new worth. If any gas leak happens of air purity detector shows the high value at that point, we are able to activate the fan to send the gas out. The camera module is connected to the Arduino UNO board as a result of in Node MCU board we've just one analog pin for camera module we are going to use a lot of analog pins, thus we tend to square measure connecting camera module to Arduino UNO. once IR detector detects the motion, the camera module is going to be turned on. The captured pictures are going to be hold on in folder of our computer and, it sends Captured pictures to the user email.

In this paper [3] the author experimented, association with the server, the information of device square measure sent to the web server for checking of the framework. the web server page that is ready to switch to screen and management the framework. By stepping into the distributed subject address inside net program this internet server page will show up. the web server offers the data relating to the temperature in higher places of the house and movement state inside the house. It additionally offers the standing of the varied electrical machines like light-weight, fan therefore forth that we tend to square measure ready to management remotely.

All the required data is place away inside the cloud (Gmail). The place away data square measure usually investigated at whenever and anyplace. the temperature in degree place away at various time interims. And furthermore, it demonstrates the condition of the movement surveyor aboard the time. It likewise provides data relating to time of movement famous and what vary of times too. This data is place away inside the cloud which can be checked by the patron whenever far from home.

In this paper [4] the author experimented, the planned system is to supply a best security and conjointly price effective answer. The system is essentially involved in overall home security of the house/any locations which might mechanically sense the more serious cases or accidents or things and send the emergency messages on the host pages or websites that more will be terribly simply accessed by the house owner's security guards or people. The system is created terribly simply accessible and user friendly. The in-depth characteristics of the system square measure those, which makes it additional attention-grabbing. The end product is to form a straightforward, interactive, easy and reliable system

In this paper [5] the author experimented; the presently engineered model of the system sends alerts to the owner over voice calls mistreatment the Internet if any form of human movement is perceived close to the entrance of his house associated raises an alarm optionally upon the user's discretion. the supply for causation alert messages to concerned security personnel just in case of vital scenario is also engineered into the system. On the opposite hand if the owner identifies that the person coming into his home is not associate interloper but associate surprising guest of his then rather than triggering the security alarm, the user/owner will create arrangements such as gap the door, switch on numerous appliances within the house, that also are connected and controlled by the micro-controller within the system to welcome his guest. The same will be done once the user himself enters the space and by virtue

of the system he will create arrangements from his doorstep specified as shortly as he enters his house, he will create himself at full comfort while not manually having to change on the electrical appliances.

In this paper [6] the author experimented, Home Automation we are able to management all electrical appliances from long distance through associate portable. during this project we have a tendency to square measure dominant Lights and Fans through a web. Even though if Wi-Fi isn't obtainable, we are able to visit 3G or 4G services to work the system. this can help North American nation to work our home appliances through a protracted distance. This author uses BlynkIoT Platform will be wont to scan, store, and visualize device information and management hardware remotely and Blynk App for mechanical man Device

The mobile app developed by Blynk works as a bearing panel for visualizing and dominant your hardware. The most wonderful element of the Blynk Platform that makes it all doable is that the Blynk Server. Blynk offers a secure, responsive and centralized cloud service through its server that permits all of this communication.

## 6.CONCLUSION

The Internet of Things involves connected devices and sensors that unit generally non-intrusive, clear and invisibles. the method is preferred for period of time home security controlled and maintaining from fireplace accidents with fast solution. The system offers better-secured home a and controlled felony problems in our house. The planned system consults the detector knowledge like temperature, motion, gas, light-weight sensors, and activates a theme following the need. More sensitive data has been collected, transferred and used by IoT devices particularly good home and tending devices, that inevitably involves additional privacy issues. New IoT devices and protocols square measure additional doubtless to contain potential vulnerabilities, that catching additional efforts to resolve these issues.

## 7. REFERENCES

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