RESEARCH ARTICLE

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Internet of Things (IoT) based Smart Home Automation and Scrutiny System

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ABSTRACT

Internet of Things is developing innovation that makes our reality more intelligent. Now a days, the home security is fundamental as a potential results of interference are growing well ordered. Security has turned into a significant issue everywhere. This project is easy, observing and adaptable home control by utilizing an embedded server with IP network and remotely utilizing Android-based mobile application. This project is an IoT based system and Home automation, by utilizing IoT, we can control and monitor different applications like Temperature, light intensity, humidity, gas, fire, motion and image from anywhere with the help of internet. It can identify the people who are in the home, with the assistance of the sensor. The focus of this project is to give preferable security system over the present level of security in the home.

Keywords: Internet of Things (IoT), Arduino IDE, NodeMCU, PIR sensor, Temperature Sensor (DHT11), Thingspeak.

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INTRODUCTION

Observing facilities will be essential and helpful for our day by day life, since it is significant for us to consider our security. This work created a system, which is sorted out with an incorporated web server, exceptionally verified cameras, Wi-Fi gadgets are associated with the web. A particular server is situated in a focal point of our project, which is called Integrated Server, which intermittently getting the recordings from some surveillance cameras through the private system. Such recordings are transmitted from the cameras to the server. The Integrated Server requires organize cameras to transmit video at an examining rate and packs the video to MPEG at that point aggregates a progression of them in the capacity. These system catches data and transmits the live video streams by means of Wi-Fi remote handset for IoT module to a Smart telephone individual application by utilizing the web [1-3].

Existing System

Raspberry pi works and live video streams and controls movements of the persons and records it for future playback. It can detect the number of people situated with the assistance of the PIR sensor. At the point when the Motion is distinguished, the pi camera starts recording and the Raspberry pi gadget alarms and send the live streaming video to the registered smart phone [4-8].

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Conflict of interest : None

Disadvantages

In this paper it only detects movements and number of persons present in the room and then sends the information to the mobile. In my project, I have additionally given modules like temperature

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and humidity sensor, fire sensor, gas sensor, relay modules.

PROPOSED SYSTEM

The system in fig.1 consists of NodeMCU as a main processing unit for the entire system and all the sensors (DHT11, MQ2, KY-026, HC-SR501, LDR) and devices can be connected with the NodeMCU. To the NodeMCU the sensors are connected & operated by it and it is used to retrieve the data and processes the analysis with the sensor data and updates it to the cloud through a Wi-Fi module.

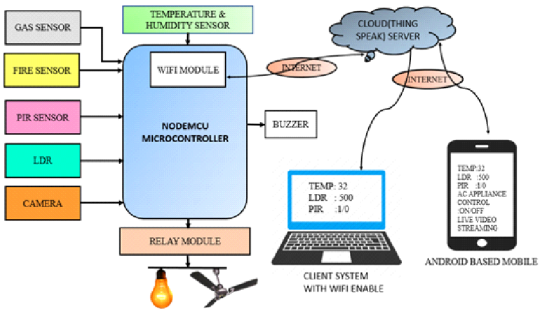


Figure 1: Block diagram of IoT based Smart Home Automation and Scrutiny System

The main theme of this project is to monitor and control the home appliances using IoT. For security purpose, we use PIR sensor and camera. If any person enters the house, then a PIR sensor will detect the movements of that person then automatically camera ON. It captures the person image and sends to the web server through NodeMCU. Using IoT platform, Android apps we can monitor the sensor parameters from anywhere in the world with the help of Internet facility. If sensor readings are abnormal and entered person is unauthorized then we can control some appliances (fan, bulb, AC, buzzer) and sends an alert to the user using IoT concept.

NodeMCU

The NodeMCU in fig.2 is a WiFi board dependent on the ESP-12E module. NodeMCU is the open source Internet of Things (IoT) stage. It fuses firmware which is continuously runs on a ESP8266 Wi-Fi SoC from the Espressif frameworks, and equipment which relies upon the ESP-12 module. The "NodeMCU" is referred to as firmware which is opposed to the advancement pack. It enables you to program the ESP8266 WiFi module with the simple Arduino IDE.

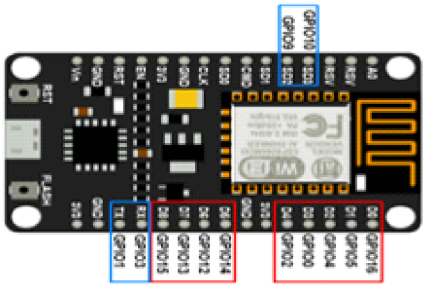


Figure 2: NodeMCU

Thing Speak

According to its Developers, Thing Speak is the open source, Internet of Things (IOT) application and Programming interface to store and recover information from things utilizing the HTTP protocol over the Web or by means of a LAN. Thing Speak empowers the making of area following applications, sensors logging applications and the social network of things with the status updates.

Flowchart

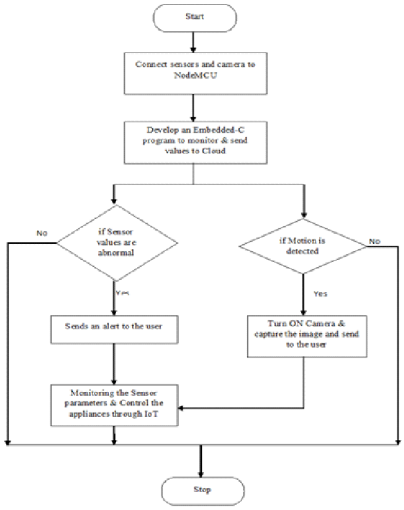
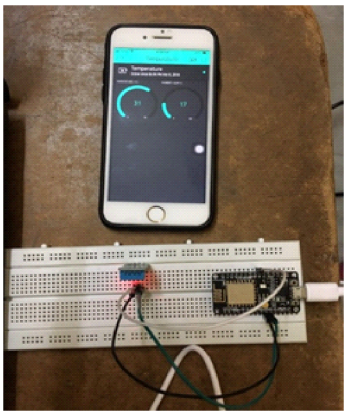


Figure 3: Flow Chart of the Proposed System

IMPLEMENTATION RESULTS

Temperature and humidity Sensor: fig. 4 gives current Humidity and Temperature sensor values of the room and can display on mobile phone using thing speak app or Blynk app. Depending on the values of the sensor, we can control fan from anywhere.



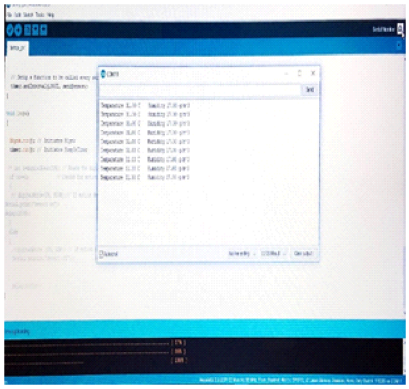
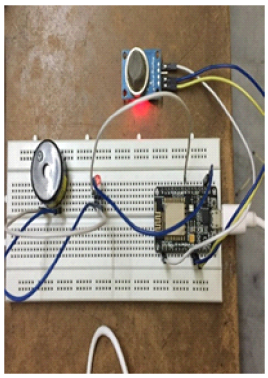


Figure 4: Temperature and Humidity Sensor values

Gas sensor: fig.5 detects the gas (LPG) and smoke and gives the alert when it increases the Threshold value.



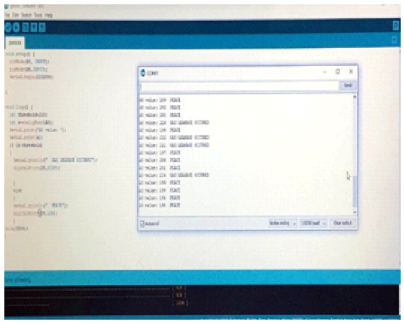
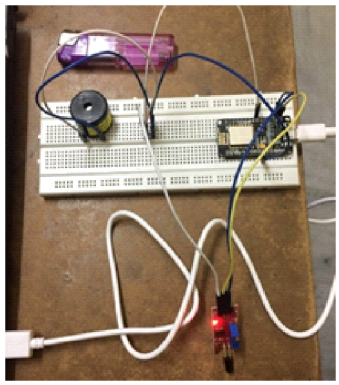


Figure 5: Gas Sensor values and detection of gas leakage

Fire Sensor: fig. 6 detects the fire, when a fire is put near to this sensor it will gives the indication to the mobile while sending a mail through wifi module.



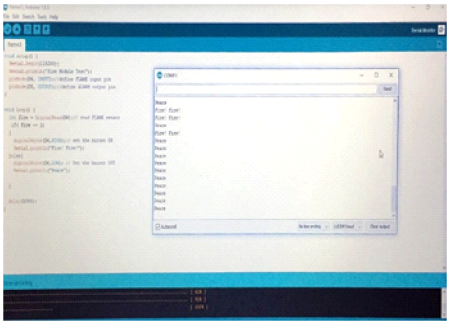
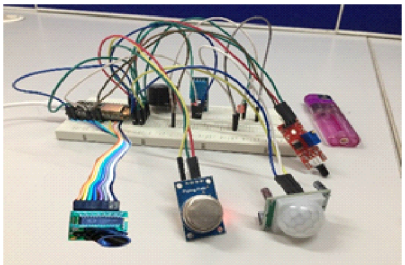


Figure 6: Detection of fire using Fire sensor

The web service application that we use here is Thing Speak, which is an open source, Internet of Things (IoT) that enables us to collect the sensor data and to store data in the cloud.



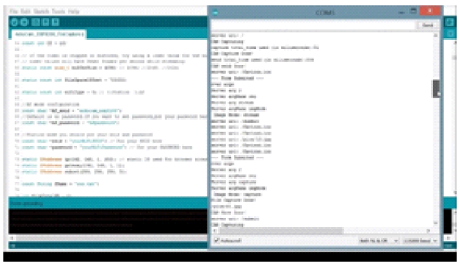


Figure 7: All sensors and Camera are connected to the NodeMCU and observing the results

CONCLUSION

This system is appropriate for continuous home monitoring, controlling the AC appliances and providing security (capturing the images) to the home using IOT. Monitoring the parameters like humidity, Temperature, light intensity, gas, fire, water level, motion and image from anywhere with the help of internet. The smart security system is capable of capturing video/recording/image and transmitting to a smart phone in the presence of the internet. If Data is abnormal then authorized persons to get a notification via e-mail. By using android based apps we can monitor and control the home appliances. The system might be utilized in numerous spots like banks, hospitals, labs, workplaces and so on that drastically curtailed the danger of unapproved entry.

REFERENCES

[1] Ravi Kishore Kodali and Vishal Jain " IOT based smart security and Home Automation system" International conference on computing, communication and automation (ICCCA 2016)

[2] European Research Cluster on Internet of Things (2014) http://www.internet-of-things-research.eu/.

[3] B. Udaya Kumar, D. S. Murty, Ch. R. Phani Kumar, "Implementation of Low-Cost Ethernet Based Home Security Using Wireless Sensor Network", Journal published at Algorithms Research, March 2013

[4] Govinda K, Sai Krishna Prasad K and susheel Sai ram 2014 Intrusion detection system for smart home using laser rays *International Journal for Scientific Research & Development (IJSRD)* 2 176-78

[5] Vinay sagar K N1, Kusuma, " Home Automation Using Internet of Things", International Research Journal of Engineering and Technology(IRJET),Vol.2,No.3,July-2015.

[6] Palla Suneetha, Kiran.Venneti, "Web based online Home Automation and security system based on wireless Video Streaming using Internet of Things", IJSEAT Vol. 5, Issue 1. ISSN 2321-6905 January -2017.

[7] P.Bhaskar Rao, S.K. Uma "RASPBERRY PI HOME AUTOMATION WITH WIRELESS SENSORS USING SMART PHONE", IJCSMC, Vol. 4, Issue. 5, May 2015, ISSN 2320-088X.

[8] Sushma.N.Nichal, Prof.J.K.Singh,"Raspberry pi Based Smart Supervisor using Internet of Things (IoT)"(IJARECE) Volume 4, Issue 7, July 2015, ISSN: 2278 - 909X.