

Home Autonetics using Internet of Things

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Abstract

The aim of this paper is to use a Wi-Fi micro-controller to create an IOT-based home automation system. As the technology rate increases every day, we're putting our technology at the forefront of mobile phones, robots, learning machines, so it's not like our home. Modern homes are increasingly shifting from standard / supported human input devices to remote control via smart / IOT activated devices.

Keywords: Arduino Microcontroller, Wifi portal, PIR sensor, LM335, Rain sensor, RS232 cable

1. Introduction

We all just dream of all the work being done for us. One of the best fit systems in this situation is home automation program. Home or smart home switches can be defined as technologies that are used inside the home to provide the user or resident with comfort, safety, convenience and energy efficiency. Home automation is a concept which involves the control and monitoring of many home automation machines in real time.

IOT is a physical communication area provided by IP (Internet Protocol) and capable of communicating with the network without human interference. This can move data across the network without having contact between humans or computers. The IOT framework has a range of hardware devices that are responsible for transmitting data from / to the server and microcontroller, such as microprocessors, sensors etc. Time is a key element. In this document contributing to the same presents a home based IOT program. The user will remotely monitor all of their home ware from their cell phone / device with the aid of the proposed program. As technology changes every second, making use of the latest technology (IOT) is very important to our paper. Most of the "IOT-based automation home" research is unfinished and needs to be done in the sector. In the future, these tasks may be on paper or apply to young people for testing / development only.

So, optimizing Bluetooth, Zigbee, GSM etc based systems is good. This paper provides brief descriptions of the need for home-based IOT, and its expense, usability,

advantages, and returns comparison with existing technologies makes it easy for the consumer to determine which model to choose from. Home automation systems are designed to reduce human effort to handle household tasks such as washing machines, air conditioning and a microwave oven. This paper aims to develop a system that uses the Internet of Things (IOT) to offer the home security.

In any suspicious or unusual behavior the device must be able to detect and track the house. By notifying the user via SMS and alerting by buzzer it must keep the home safe. The computer may be an Android device, a remote control or an intelligent watch. It is safe to say that automation systems are growing with technology change. Typical home systems use big Wifi, Wi-Fi, Zigbee, Arduino, GSM, etc. technologies. Many systems had some advantages but they were hard. Work should be undertaken to every their condition and to fix it.

2. Related Works

There are numerous researches performed on home autonetics using iot, few of them are listed in our related works.

The authors in the [2] sensing rainwater principle for closing the window are not new. In older systems, wiper was used to manually operate the wiper, and the process of pulling the wiper was very difficult. Their work was therefore aimed at changing the system by providing automatic cleaning.

In this paper [3] Internet connectivity enables the smooth

operation of devices which have become indispensable parts of our everyday life and nature. The Internet offers the provision of connecting and networking devices of various kinds such as sensors and fitness devices. Practically, each part of the exercise contains controlled temperature schedules as well as humidity. The exact temperature value with its significant characteristic in any region, however, is important in monitoring.

In this paper[4] we will automatically use the PIR sensor to provide electronic on / off electronics. It is chosen for this project to be built using a PIR sensor to use automatic lights and fans using Arduino via the smart home Internet of Things. We have a revolt in all of the electrical equipment in our homes today. It can contact itself via home app, using a mobile phone or other internet. People waste a lot of energy because it's not understood that when they leave their homes, they destroy lamps, fans and several other electrical objects.

This paper[5] describes a modern home automation system design and prototype implementation that uses WiFi technology as a network infrastructure that connects its components. On the one hand, they provide greater comfort, particularly when operating in a private home. On the other side, the integrated system built in commercial buildings not only maximizes comfort but also facilitates central heat, fresh air, air conditioning and light control.

This paper[6] explains how to incorporate control of physical parameters with GSM module via IoT applications. Eventually, the values are displayed with the aid of each LCD display. The microcontroller is linked to the PC via a zigbee bus and with the aid of RS232 communication the result will be displayed on that PC. This data is collected and uploaded to the cloud in a Laptop.

3. Proposed Scheme

Cloud is the cornerstone of every online network that is like a central server based primarily on delivering services without physical hardware being needed. The device-connected centralized server sends and evaluates data generated from our homes, and sends current status to our smartphones. Server controls the whole database, which even adjusts when any changes are made at home end. The biggest advantage of this system is that it uses smartphones or computers to monitor certain simple functions as this type of device installed at home is called an automated or smart home sitting anywhere in the world globally. This system is also very useful for energy use. The proposed system is composed of WIFI modules and sensors servers. Arduino, a small programmable computer board with built-in Wi-Fi module that will act as a server, is the main sensor board that will run all operations and link our sensors to the cloud here.

Current home-based applications at Present use only limited technology on that computer. And, in short, we are

making our IOT apps in our homes obsolete. The ARDUINO microcontroller and Relays are used for remote control of the electrical transmission from the server built into esp8266, according to this paper. After verification the user can monitor the change using the web application.

4. Methodology

System consists Microcontroller as minicomputer connected with sensors, motors, Wi-fi and display. As soon as connects power supply to the system all the sensors, controller, display, Wi-fi will get initialize and controller starts reading sensor data and sends all the information to the AWS(Amazon Web Services) cloud using cloud IP address. When the sensor values increases above threshold an alert SMS(Short Message Service) will be sent to owner. PIR(Passive Infrared) sensor is used for Automatically turn ON and turn OFF the light. Rain sensor is place near window when rain water falls on the sensor window is automatically closed using sliding mechanism.

Temperature sensor is used for inside home temperature control. FAN turns ON and then turns OFF depending on temperature.

All the sensor details and status will be displayed in the webpage and user can access his/her home information from anywhere in the world.

1. Home Unit

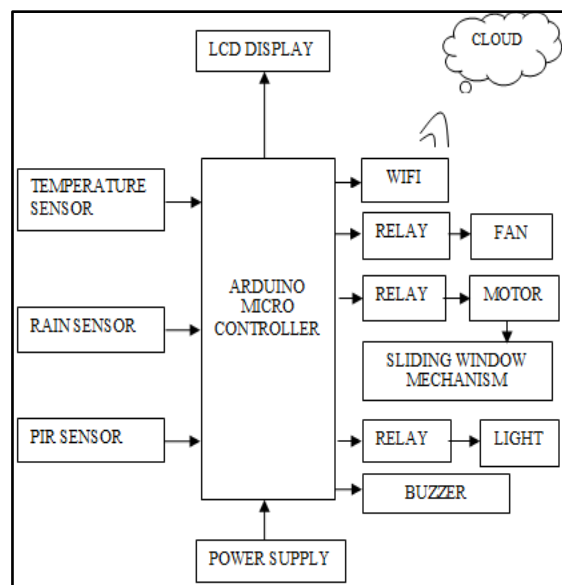


Figure 1: System model of the proposed scheme

2. Monitoring Unit :-

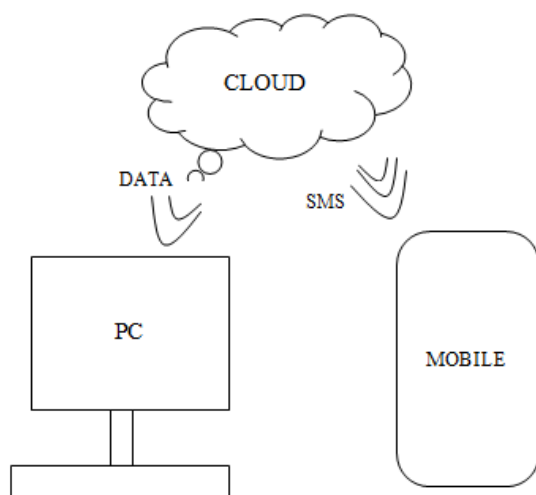


Figure 2: Data transfer model using cloud

Application and Features:-

- Users can access sensors instantly and monitor the events around their region on their screens from anywhere in the globe.
- Sensors gathering information and transmitting updates through the internet to smartphones.
- Cloud-based solution.
- Service by SMS.
- Connectivity via Wi-Fi.

5. Result and Analysis

A. Arduino Uno

As shown in the fig 3, Arduino is one of the important part of our project, it is a microcontroller which is involved in the overall working of the smart cart and coding. Arduino is mainly used for receiving and transferring the data. It is easy to use, alter and reset the code as per the user needs. Arduino will be given with external power supply. It has a reset button to erase the existing code and re-write the other. The details of the scanned products will be displayed on the LCD and the same will be received by the Arduino and sends back the information to the backend through Wi-Fi module.



Figure 3: Arduino UNO

B. Temperature Sensor(LM335)

As shown in the fig 4, It is a low cost temperature sensor and gives highly precised results. In range of -40°C to 100°C .



Figure 4: Temperature sensor(LM335)

C. Rain Sensor

As shown in the fig 5, Protecting the interior of houses is very beneficial, because it automatically works by sensing the water. To close the window the idea of sensing rainwater.



Figure 5: Rain sensor

D. PIR(Passive Infrared) Sensor

As shown in the fig 6, This is an electronic sensor that measures the light infrared (IR) from objects.



Figure 6: PIR sensor

E. Wi-Fi module

As shown in the fig 7, This is a self-contained on-chip system with integrated TCP / IP protocol stack that can provide access to the Wi-Fi network for the microcontroller. This is able to host an application, too.

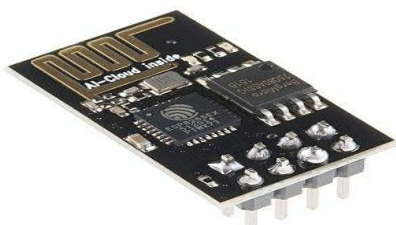


Figure 7: Wifi module

F. Relay circuit

As shown in the fig 8, Relays are switches which electromechanically or electronically open and close the circuits.



Figure 8: Relay

We interfaced temperature sensor(LM335) to arduino board as well as rain sensor and PIR sensor to arduino microcontroller to their respective ports. And to monitor this sensors we have been connected with LCD display to monitor the values from the incoming input from the mentioned sensors.

In this we are using IOT based applications to get the desired input from the wifi LAN. From all this connections by using Relay we can controller the output by given

outputs Fan by Temperature, Motor with sliding window mechanism by Rain sensor and Light by PIR sensor as shown in the fig 1. Together by the functioning of Arduino microcontroller can make house hold IOT based Home Autonetics using Internet using Things.

Using a Wi-Fi micro controller, we built an IOT-based home automation system. As the technology rate increases every day, we're putting our technology at the forefront of mobile phones, robots, learning machines, so it's not like our home. Modern homes are gradually shifting from standard / supported human input devices to remote control via smart / IOT activated devices.

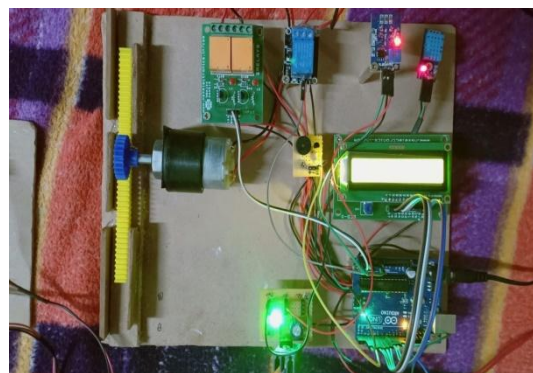


Figure 9: Working Module

6. Conclusion

Home automation has moved us further away from conventional ways and increased innovation has led us to make full use of our homes and apps. Future homes will most likely deliver realistic and advanced protection to their owners and IOT devices make revolution in smart homes possible. When we step through the coming people a increasing range of gadgets can begin to interact with each other. The vision is a future in which information is transmitted between gadgets and people without having to relay on the manual contribution of individual bytes. PCs that can then mine information and then use that information to alter parts of home condition is what's to come up with.

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