
LEAST POWER CONSUMPTION HOME AUTOMATION THROUGH IOT

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ABSTRACT: The main aim of the project is to develop a system that will provide remote control of home appliances and also provide security against the mishaps when the home host is not at home. This paper is mainly concerned with the automatic control of light or any other home appliances using Internet. It is meant to save the electric power and human energy. This project is made with the help of Microcontroller Adriano, Relay and various sensors. The various appliances connected to the microcontroller and sensors are connected using wireless network (Local Wi-Fi).

“Home Automation through IOT” is basically communication of physical devices over internet so it’s clearly visible that by using this technology real world equipment’s like lights, fans, tubes and other devices can be operated from Internet.

Keywords: Microcontroller, Relay, Adriano, Sensors, Wireless network, Wi-Fi, IOT.

INTRODUCTION

In the IOT, things are expected to become active participants where they are able to interact and communicate among themselves by exchanging data and information sensed about the environment. In this paper we use IOT for controlling in home. It is the name of latest technology which is giving to be new future of whole world. IOT is the combination of three different leading technologies of World internet (web programming), embedded system programming and electronics.

IOT is the communication of physical devices over internet, through which you can give instruction to your home appliances like to switch ON / OFF fans, lights when no one is there to utilize them through internet. Through IOT, such which robots which are under your control rights through from your internet which can be operated from your smart phone, your laptop or your computer or tablet that too from anywhere in the world.

METHODOLOGY

The main part of the system consists of a Microcontroller with an Ethernet module for controlling. This Ethernet module is connected to a Wi-Fi router which gives a static IP address (URL to website) I.e. a web page to it so that it can use TCP/ IP based communication with other accessing devices connected to the same router. This module is connected to many appliances through relay devices to turn on and off those devices according to the passed instructions through internet. Based on the encountered Uniform Resource Locator (URL) from the internet browser which contains embedded strings that has a control byte, once picked by the server, will be executed as a specific command attached to the string. A manually assigned IP address is assigned to the server which is in this case 192.168.0.155. Initializing the server will make a request to the server to open a listening connection and after receiving a URL such as 192.168.0.155/? (Control Byte) it will display the current state of sensors and I/O devices and provides manual control, i.e., Human Interface. As the relay devices are current controlled device, current amplification is needed to support low current output of the microcontroller and hence the connected appliances like fans / tubes / air conditioner are either turn ON / OFF according to requirement. To make this design more efficient an automatic system has been designed as well.

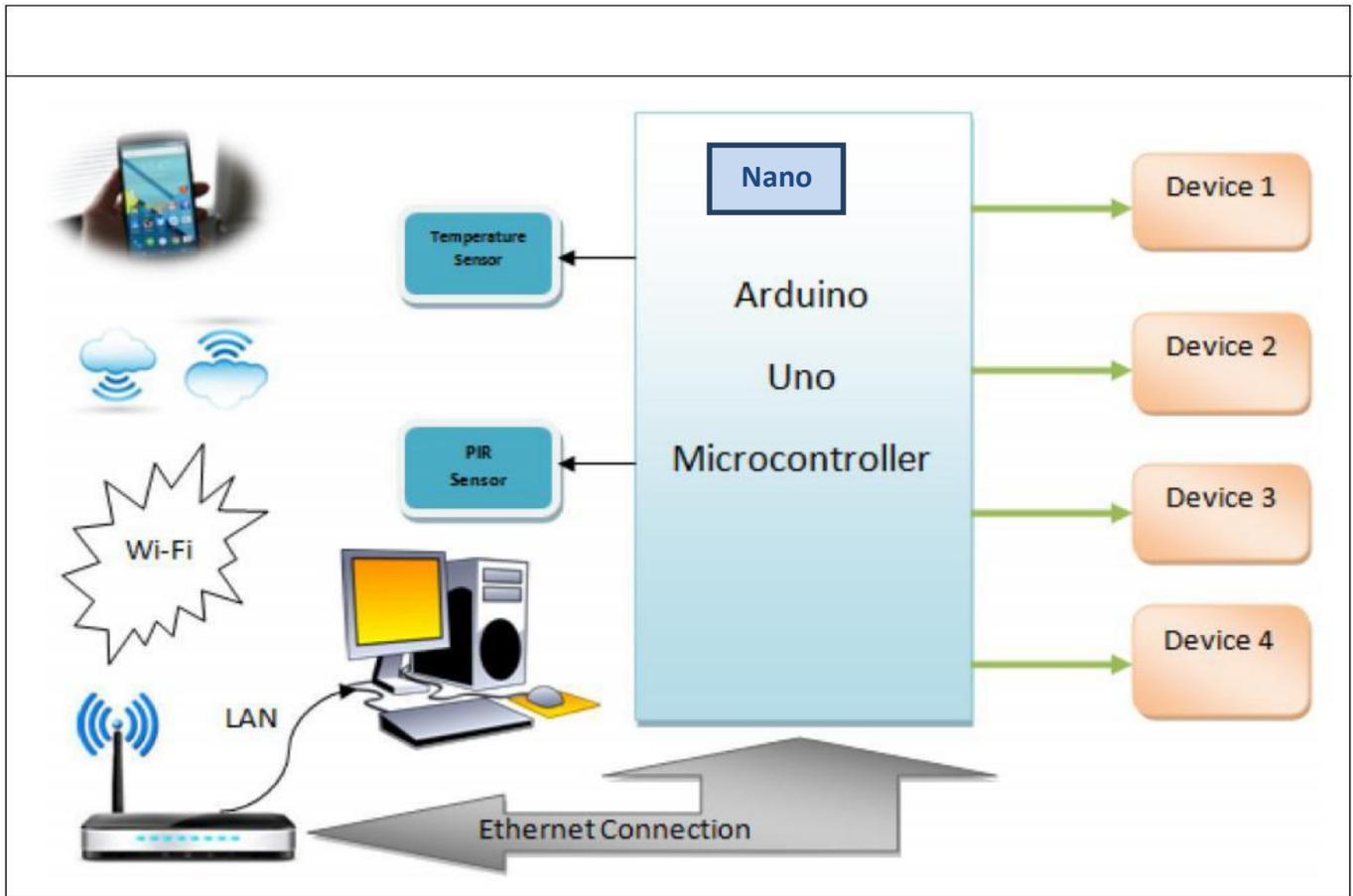


Fig. 1 System overview and design

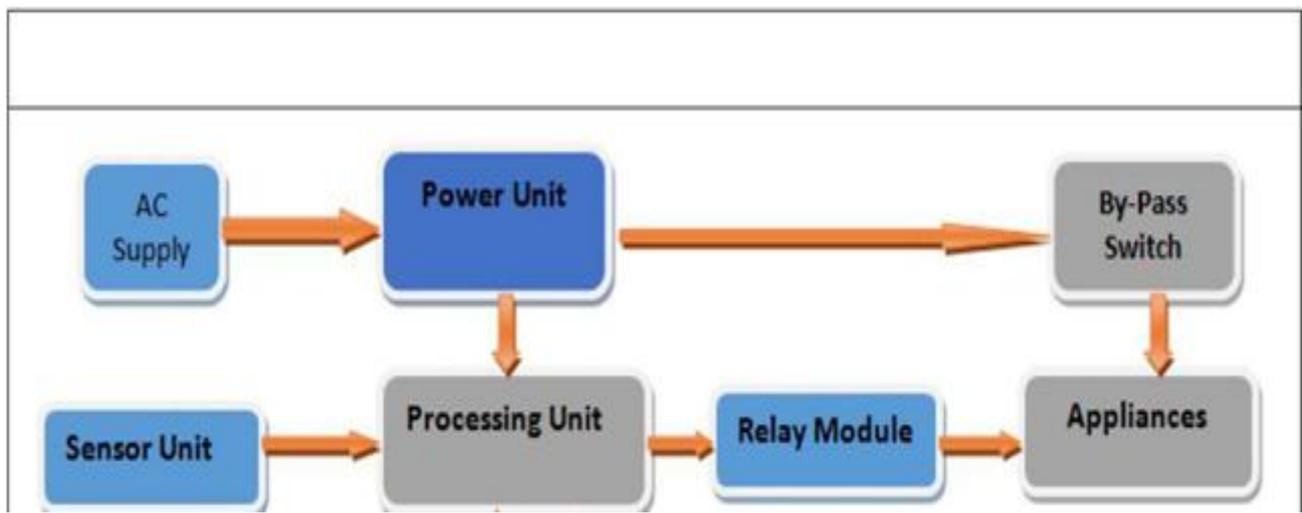


Fig. 2 Block Diagram of Proposed Design

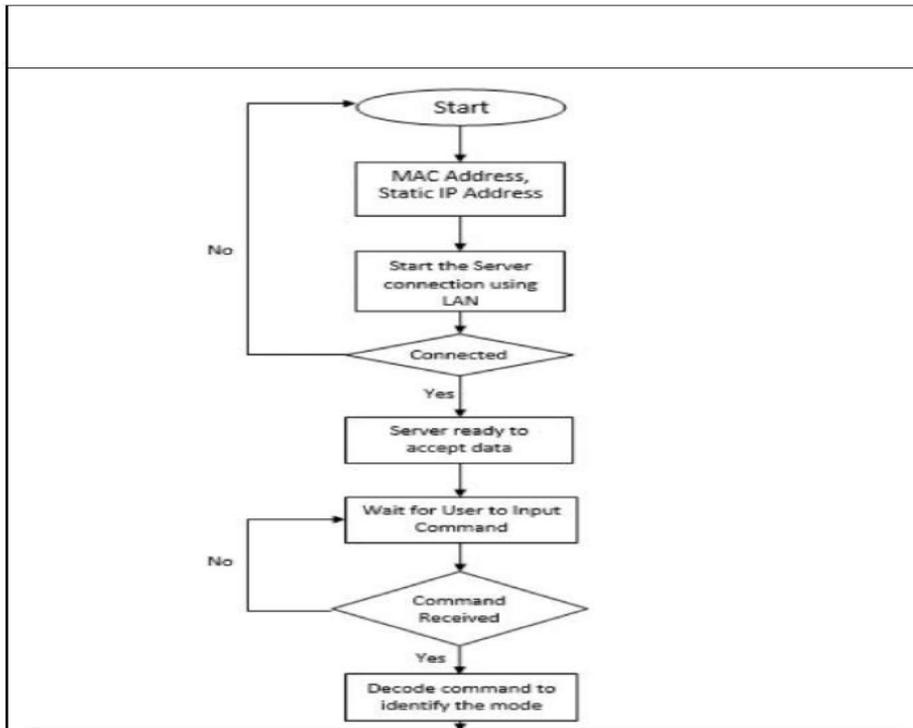


Fig. 3 Flow Chart

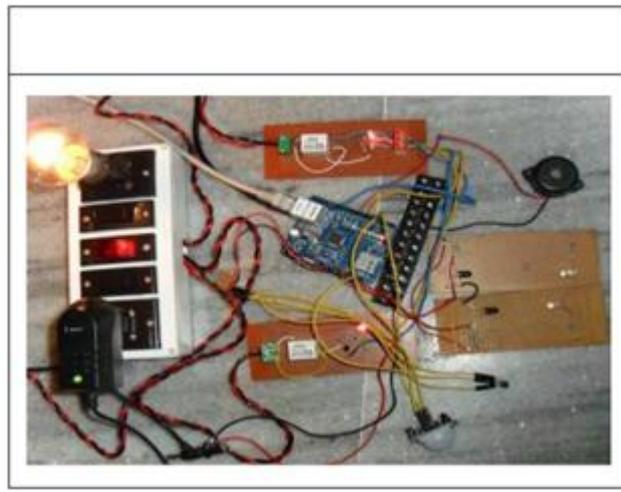


Fig. 4 Working View of Project

APPLICATIONS OF IOT

- a) Smart Cars
- b) Smart cities
- c) Buddy Home (Home Automation)
- d) Automatic Lamp Post
- e) GPRS System and Path Tracking
- f) Highly secured digital locking and information system
- g) Digital road maps

CHALLENGES

- a) Since we may be at a far distance from original place where things are situated so data being sent will take time to reach to source which may be a significant gap between instruction firing and instruction execution.

b) Not only that but because we are working on internet therefore network bandwidth is also a big issue to deal with.

ADVANTAGES

- a) Most prominent advantage of this project will be for physically handicapped people, with the help of this project without moving anywhere they can operate their electricity at home.
- b) It is a wonderful initiative for old age people who are not able to move much from their place so they don't need any care taker sort of person for arranging their day to day life.
- c) Commercially it is a wonderful approach for huge premises where we have huge wastage of power, electricity and man power.
- d) As lot of people are required for switching lights ON / OFF regularly so lot of time and money is wasted but after this they can be utilized in doing other useful jobs.
- e) Speed and Accuracy of systems will be increased 100 times better and faster than current scenario because physical and human movements will be dramatically minimized whole systems will be automated therefore jobs of hours will take seconds so huge saving of time and effort.

TECHNICAL DESCRIPTION

- **Software's Description:**
 - **Audrino:** It is basically an IDE to make embedded programs. It is chosen for this project because of its easy, fast and efficient working so that without facing difficulties of programing we can fully focus on application.
 - **Ethernet Module:** Since working on IOT (Internet of Things) therefore networking is required so we will have to attach some routers to avail network and for programing of routers we need Ethernet Module as software.
- **Hardware Description:**
 - **Microcontroller:** Atmega8 microcontroller will be used to program several input and output devices.
 - **Relay:** It will play major role in controlling project because Relay is the device which changes a digital input into an analogue input and provide several useful features for home automation project
- **Major Device's Description:**
 - **LAN Cables:** For making a network, so that internet can be available to routers.
 - **Development Board:** It is required to place ATmega8 and other hardware devices to place together in a feasible set up which can be delivered to client.
 - **Routers:** Will be required to create a Wi-Fi network for accessibility of internet.
 - **USB Cable:** Will be used to write program in microcontroller's flash memory.
 - **DC Geared Motors:** Will be representing fans of buddy home, so motor will be required to move fans.
 - **LED:** To test output of programs LEDs will be required.
 - **IR Sensors:** Sensors will be required to provide additional features to buddy home like by touching an appliance you can switch ON / OFF.
 - **LDR:** Will be required to judge amount of light available so that day and night can be detected in order to provide automatic lights ON/OFF in "Buddy Home".
 - **Wires and Cables:** As per requirement. And other things depend on need during development.

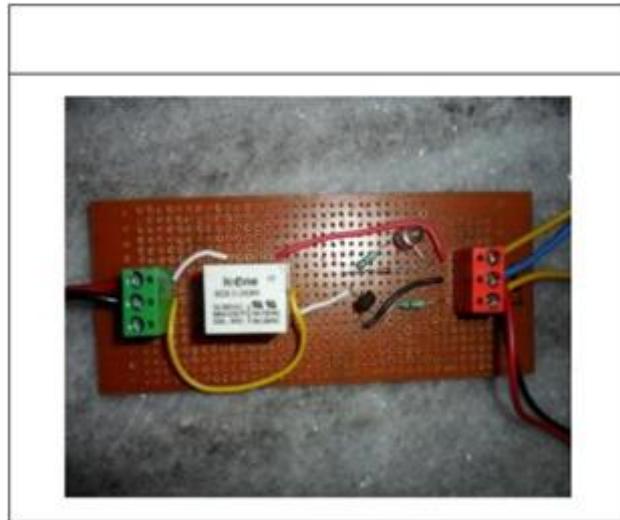


Fig. 5 Relay Board



Fig. 6 Adriano with Ethernet shield

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CONCLUSION AND FUTURE WORK

With the advancement in technology, it is expected that the availability of internet is everywhere and online at all the time. In this paper we proposed a design of a smart home system that integrates electrical devices in a house with each other. The techniques which are going to use in home automation includes the control of domestic devices such as TV, fans, lights, washing machines etc. In this paper we are planning to eliminate the most of human interaction to the device just to switch ON / OFF them and hence to reduce the additional expenditure. Development of such Smart home achieve by using “Internet of Things” by using these systems we can actually manage to make low cost, flexible and smart home. Using this system in near future as frame work, the system can be expanded to include various other options which could include home security features like capturing the photo of a person moving around the house and storing it onto the cloud. This will reduce the data storage than using the CCTV camera which will record all the time and store it. This kind of a system with respective changes can be implemented in the hospitals for disable people or in industries where human invasion is impossible or dangerous.

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