SMART HOME AUTOMATION USING SENSORS

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# ABSTARCT

Home automation involves introducing a degree of computerized or automatic control to certain electrical and electronic systems in a building. These include lighting, temperature control, security systems, garage doors, etc. A hardware system is installed to monitor and control the various appliances. The system would control the appliances based on its configuration. For example, it could automatically turn on the lights at a specified time in the evening, or it could measure the ambient light using a hardware sensor and turn on the lights when it grows dark. It can also allow a person to control appliances from a remote location, such as over the internet. For example, one could turn on the air conditioning from the office, before leaving for home.

This project demonstrates a simple home automation system that allows the user to control it with a wireless device such as a Wi-Fi or Bluetooth enabled mobile phone. A desktop PC is used to run the server software. The system allows the user to control each of the lights and fans individually. It can automatically turn off the main lights and turn on a night lamp at a specified time. By measuring the signal strength, it can detect when the user enters a room and automatically turn on the light and fans, and then automatically turn them off when the user leaves the room.

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1. **INTRODUCTION**

A typical home automation system allows one to control house hold appliances from a centralized control unit. These appliances include lights, fans, air conditioners, television sets, security cameras, electronic doors, computer systems, audio/visual equipment, etc. These appliances usually have to be specially designed to be compatible with each other and with the control unit for most commercially available home automation systems. The project integrated into a building’s electrical system and allows one to wirelessly control lights, fans, and turn on or off any appliance that is plugged into a wall outlet. The system can be controlled from a Laptop acts as the server. Thus the installation cost and hardware cost is kept to a minimum as most users already own the requisite hardware such as a mobile phone and desktop PC.

A wire is said to provide connectivity between the server and the controller. The power supply for each appliance is wired through an electromechanical relay. A number of relays are used depending on the number of appliances to be used.

All the relays are controlled by a microcontroller. The microcontroller is connected to the server via a USB interface. This makes it plug-and-play and compatible with virtually any PC. The system can be configured with time-based profiles. For example, one could have it automatically turn on the lights at 6:00 in the evening. At 10:00P.M. it could automatically turn off the main lights and turn on a night lamp. It could then turn off the night lamp the next morning. The server can also connect from the internet to receive various data.

“Implementation of a Low-Cost Home Automation System”, demonstrates a system that can be

# METHODOLOGY

The sensors connected to the microcontroller board are LM35, PIR and LDR sensor. LM35 is used to sense the temperature level in the house while LDR sensor is to sense the light intensity. The data sensed by the sensors are then used as feedback for automatic control of home appliances. The Main thing about these project is the whole project is only works when Somebody is present in front of PIR sensor Otherwise is turned OFF at all time.

* Total operating system is working only when the PIR sensor is active.
* When temperature of sensor is more than 30⁰ Celsius then automatically the fan will turn ON.
* When LDR detects darkness it turns ON light bulb.
* The bulb is automatically turn OFF at day time.
* Whole system is turned of when no one is in front of PIR.

# IMPLEMENTATION DETAILS

Initially an Arduino relates to the IR sensor which helps to detect the presences of an object. In the following image connections, can be observed; an LED is connected to the 13 pin in the Arduino which is a digital pin. A DC motor is connected to the analog pin A1. In IR Sensor, we have 3 pins; one is the digital output pin where the remaining pins are ground and Vcc. The power we supply to the IR sensor is 5v, so we connected Vcc to 5v slot present in the Arduino. The following set up works when an object is present in front of the IR sensor. When an object is detected in the range of IR it switches on the LED and the DC motor.

When no object is present in the range of IR sensor then LED and DC motor will remain switched off as shown in the above image. When an object is present in the range of IR sensor the Arduino switches ON the LED and DC motor. In continuation to this we have added photodiode as to get the intensity of the light. The concept of photodiode is to assure that the room is dark. In some scenarios, we may get sufficient light that is required for the person in that room and he need not switch on the light and even the climate may be cool so that he need not switch on the FAN. For satisfying this condition we prefect photodiode which collects the intensity of the light and more over photodiode can reduce the overall cost of the product. We continued our project by connecting the photodiode to Arduino, it helps us to get the required output that satisfies the given conditions.

# CONCLUSION

The data that is uploaded to the server is not been stored; As the definition of IOT states that the data that is generated should be stored on the cloud and it should be shared by another device. So, a work must be done on it to store the data that is generated by the sensors. The data that is generated can be viewed from any device which is connected to the same cloud server and we can retrieve the data from cloud to analyze it and to control the lights and fans by using a mobile device.

# REFERENCES