

A REVIEW PAPER ON HOME AUTOMATION

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Abstract

Automation has a wide scope in the future generation. Although people have started using it in their homes, it only resides for the rich. Automation for now is expensive. Mobile application communication plays a great role in home automation. In this paper we will discuss various technologies being used for home automation. We will discuss about various sensors we can use for home automation and at the end try to give a solution to make a cheap and reliable home automation system. The proposed system consists of Arduino Uno board, android application, Wi-Fi or a Bluetooth module and a few sensors. This paper also discusses about the Machine Learning reaching the world of home automation.

Keywords: Automation; Bluetooth, Sensors

Introduction

Home Automation leads to the making of Smart Home. In the present era people spend most of their time on their mobile phones. Research have been going on for decades to minimize power consumption. Hence to engage every individual in the act the concept of automated home was introduced, where one could communicate to appliances using web application.

Home Automation is a system which can establish connection to most of the devices in the house which allows you to control almost all of the devices from a mobile application. For example, a centrally placed microcontroller has the ability to control appliances like LED, air conditioner, thermostat, security systems and other appliances.

Smart home appliances connect to devices over Bluetooth, Wi-Fi or IOT.

Initially home automation was introduced to access appliances from a single mobile application. Later it started to be used for security purposes. It became easier for people to keep an eye on their house even when faraway point. People can now monitor their homes live from any place.

Introduction of various technologies to home automation has made it more reliable and secure. It has helped the elderly and the disabled to lead a better and a better life. With the involvement of artificial intelligence home automation has become more effective. Speech recognition has made its place in every market. It has allowed people to control various appliances just by their voice.

Safety has increased and not only in terms of security. Introduction of gas sensors in the household has made homes safer than ever. These sensors have reduced the risk of house fires.

Figure 1 shows the basic architecture of an automated home system.

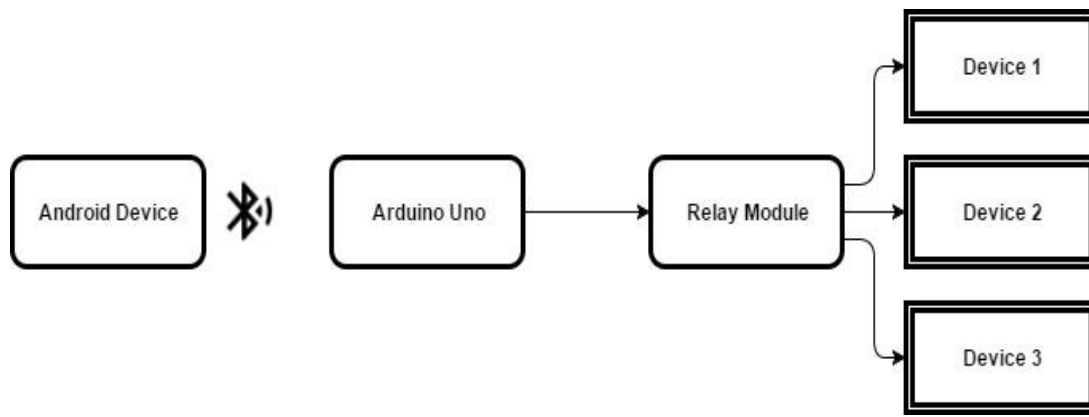


Figure 1. System Architecture

Literature Review

Nikita Baidya [1] proposed a home automation model using basic ESP8266 Wi-Fi module with Arduino Uno R3. She used this system to control lights, fan and other appliances. She used an android application to send communication signals. Further she used relays to connect the Arduino to the home appliances. Here Wi-Fi module has been used with the justification that it is more reliable and has a greater range.

Mamata Khatu, Pratik Jadhav and Syedali Adnan Rizvi , Neethu Kaimal [2] presented a paper on home automation using Internet of Things. This makes every appliance accessible from any place and not just home. They have also focused on Cloud computing. This method has various application Agriculture , Environment Monitoring.

B.Murali Krishna, B.Rakesh, K.Ravi Kishore Reddy [5] proposed a paper on home automation using Bluetooth module using FPGA. They used a HC-05 module and a Arduino Board for this purpose.

T.Ayesha Rumana and Smitha M [3] proposed a paper on hand gesture based home automation system for visually impaired people. This system has been achieved with the help of MEMS accelerometer which sensed the acceleration of a hand in all directions and then signal is transmitted to wireless protocol via radio frequency.

Akansha Singh [5] presented a paper of home automation using GSM technology. It can control the appliances even with absence of android application over sms. This system is helpful in the case of absence of android phone or internet connectivity, where you can turn off the appliances by simply turning sending sms.

D.Mahesh Kumar and Sirisilla Manohar [4] proposed a paper on E-mail interactive home automation. They provided basic application of automation using GVT app. The coding is flexible in user friendly manner. The advantage of this method over others is it removes the need of web server as it uses the server of Gmail. GVT app system is a economic and smart platform for implementing home automation.

Nainsi Soni and Manish Dubey [6] proposed a paper on home automation with artificial intelligence. They gave an algorithm to construct a decision tree which was less complex. This algorithm is used in home automation for speech recognition. According to the paper published decision tree algorithm is unique as it easily fits for the rules of classification and prediction. They proposed a paper to combine ant colony optimization and decision tree algorithm to for an automated home system that is more accurate and self learning.

Naresh Kumar and Praveer Singh [7] presented a paper which allowed home automation at a very affordable cost. They used the basic electric components like Arduino Uno, Relay, Bluetooth module and resistors and other electronic components. They connected all the appliances which only need to turned on and off to an android application from where they could easily control the appliances.

Conclusion

Home automation industry is one of the leading industries. It has made the life of every individual easier and made their life safe and secure. Although the system being worked upon are cheap and reliable still they do not cover many appliances of our daily life. I propose a system in which houses with swimming pool can be fit with rain sensors which can be used to cover the swimming pool when it rains. Further automatic time based garden watering system can be made to save water. Using PIR sensor to switch off the lights if the motion is not detected for a period of time can really help reduce power consumption. Using MQ2 sensor to detect gas in case of gas leaks, which automatically alerts you via GSM technology will help reduce household fire. Not only inside the house we can use automation in our garages. Using load cell sensing to open the garage door.

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