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# Smart Home Automation using Internet of Things

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**Abstract:** Home automation achieved great popularity in the last decades and it increases the comfort and quality of life. In this paper an overview of the current and emerging home automation system is discussed. Iot helps us in monitoring devices and also uses Wi-Fi technology as a communication protocol to connect system components. Home automation has a vital role in reducing the energy consumption of all the home appliances used. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection

**Keywords:** Arduino, ESP8266 Wi-Fi module, sensors, Internet of Things.

## I. INTRODUCTION

The home automation systems are gaining popularity due to their flexibility and ease in use of the appliances. Home automation is undergoing several researches and developments so that it acts as a real time application. In the present times people always tend to cling to their mobile phones and smart devices throughout the day. In home automation mobile phone acts as a companion which helps in controlling all the home appliances and the electrical equipments in home. This is done with the help of voice control system with a Wi-Fi interconnection. The user sets a threshold value so that the energy consumption does not exceed the threshold limit and this helps in reducing the overall energy consumed in that house.

## II. RELATED WORKS

### A. Home Automation System Via Internet Using Android Phone

This project aims in bringing out a low cost, flexible and a standalone home device control and a monitoring system using Arduino micro-web server[1]. The design is based on a Android phone with a home automation system application with a Arduino Mega ADK embedded with a micro controller. The user can connect to the application through Android and send control indication to the Arduino ADK. The Arduino ADK which in turn controls all the other devices and the embedded sensors.

### B. Arduino Based Home Automation Using Internet Of Things

The overall implementation of this system is to indicate the status of the monitoring system[2]. The Arduino Uno has the main controlling unit which consists of four relay channel boards to control all the electrical home appliances. This Iot system is monitored for various load conditions of various houses. The user needs to get connected to the application and install the software in his/her laptop or android phones. Once the setup is installed a home is displayed where the user can keep track of all the electrical devices.

### C. Voice Controlled Home Automation System

The fundamental point is to utilize human voice to control lights, fans, AC for security reasons after alteration for instances[3]. The control for every framework or interface of remote camera is also utilized and voice acknowledgement is prepared. With the help of Arduino message is sent with respect to the voice to relay and operate the signal of the respective load. The implementation of android and the Android application is done with the help of Bluetooth.

### D. Arduino Based Home Automation Using Android Application

This system design is to provide support in order to fulfill the needs of disabled and elderly people[4]. Home automation system is automated using bluetooth interfaced Arduino which controls a number of home appliances like fans, lights, bulbs and many more using on/off relay. Arduino Uno is programmed using Arduino IDE software and design using C. Arduino provides a good paradigm for automated system based on both mobile phone and Bluetooth.

### E. Smart Home Automation System Using Bluetooth Technology

In this paper the ultrasonic sensor and the plates are used for water level detection[5]. In addition it has the ability to record the measurement of sensors and record it in an android application. The smart phone application has the ability to interface upto 18 home appliances. It is also tested along with the sensors up to 100% efficiency. The proposed system can control home appliances over a short range of wavelength.

#### F. An Overview Of Home Automation Systems

In this paper a voice recognition is used where it can be recognized by the names of all those appliances [6]. This automation system uses Zigbee RF modules for the implementation of wireless modules inside the home appliances. Internet of things mechanism is used here to monitor the various processes and mechanisms taking place. Electromyography(EMG) can also be used so that it can also be converted into gestures based on the convenience. Different types of communication techniques can also be used so that it is interfaced with the microcontroller board.

#### G. Web based home automation using IOT

This paper is based on a simple idea on Raspberry Pi based using a web interface and controlling the appliances[7]. The algorithms are linked to GUI via a html or a php platform. This is connected via Ethernet port. Programming platform is done based on Linux, python and Html. This paper also focuses on the energy efficiency of the usage of the home appliances.

#### H. IOT Based Home Automation Using Arduino

In this paper Bluetooth is used as a communication link via the home automated Arduino setup[8]. It avoids the use of Voice recognition even when the Wi-Fi connection is not available. Any smart phone can be used for implemented this home automation using Arduino. Even when the Wi-Fi is turned off the 3G or 4G can engine these cellular networks. This implementation is done so as to reduce the energy usage of these home appliances.

#### I. IOT Based Home Automation using Raspberry Pi

This is connected to the website where all the measurements of the home appliances are stored and displayed[9]. The passage of the Raspberry Pi passes through the Relay driver circuit and then the relay which leads the home appliances. GSM , Zigbee and Wi-Fi are also connected in this implementation. It also adjusts the circuit according to the modes of the Raspberry Pi.

#### J. Home Automation Using Wi -Fi Interconnection

This system uses Wi-Fi interconnect for the communication protocol to connect system components[10]. First the number of unit order is sent so that it can be connected locally or remotely. Second the Arduino senses all the components and notes the measurements of all the home appliances. This in turn communicates through the Android technology via a wireless link.

### III. CONCLUSION

This Home automation mainly supports handicapped and elderly people. Voice recognition is enabled so that words are recognized and it helps in easy understanding of the requirements. It also helps in the smart energy efficiency of all the home appliances. This also keeps us a good track of all the appliances at home.

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