HOME AUTOMATION USING ARTIFICIAL INTELLIGENCE

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Abstract- Smart-home concept has been around for many years and played a very important part in the design and implementation of future houses. The main objectives of home automation are controlling, management and co-ordination of home appliances in a comfortable, effective and secure way. It contains large number of sensors which can be monitored. On other hand, Artificial Intelligence is evolving as a technology for developing automatic systems and can make decision using case based reasoning. Using, decision making and reasoning the AI provides a better solution for almost all automatic systems. The sensor can be specialized in measuring temperature, humidity, light, and movement the system also supports voice command for naive users with command sensing .it decodes the users voice command and extracts the exact meaning of his command. The design is based on a standalone Arduino BT board and the appliances are connected to this board using Relays. Purpose of creating a home automation using artificial intelligence means user can easily controlled electronics appliances. so, the problem in saving electricity can be resolved, and main moto is to uses the home automation without being use internet.

Keywords- Arduino, Artificial Intelligence, Relay module, temperature, humidity, PIR Sensor.

I. INTRODUCTION

Automation is a technique, method, or system of operating or controlling a process by electronic devices with reducing human involvement to a minimum. The fundamental of building an automation system for an office or home is increasing day-by-day with numerous benefits. Industrialist and researchers are working to build for efficient and affordability automatic systems to monitor and control different machines like lights, fans, AC based on the requirement. Automation makes not only an efficient but also an economical use of the electricity and reduces much of the wastage. Homes of the 21st century will become more and more self-controlled and automated due to the comfort it provides, especially when employed in a private home. A home automation system is a means that allow users to control electric appliances of varying kind. Home automation is the residential extension of building automation and involves the control and automation of lighting, heating, appliances, and security. Modern systems generally consist of switches and sensors connected to a central hub sometimes called a "gateway" from which the system is controlled with a voice command. Home automation systems are quickly emerging and becoming popular nowadays in the world and its end users are specifically the disabled and elderly but due to their complexity and cost it is not always accepted.

II. LITERATURE SURVEY

The first smart homes were ideas, not actual structures. For decades, science fiction has explored the idea of home automation. Prolific writers, such as Ray Bradbury, imagined a future where homes were interactive, and seemingly ran themselves. In Bradbury’s cautionary short story, “There Will Come Soft Rains” he describes an automated home that continues to function even after humans have died out. It’s all well and frightening, until you consider the actual benefits of home automation, and then the idea becomes more comforting than chilling. Although the idea of home automation has been
around for some time, actual smart homes have only existed a short while. This timeline focuses on hardware; meaning actual inventions leading up to the smart homes we know today and can expect from the near future.

In android base home automation Systems that allow multiple users to control the appliances by an Android application or through a website is presented. The Systems is three and hardware components: a local device to transfer signal to home appliances. a webserver to store customer records and support services to other components. And a mobile smart device running Android application. [1]

In Home Automation using ATmega328 Microcontroller and Android Application in This paper we describe a remote based application controlled system which can controlled a household appliance by sending an SMS message from mobile phone. This controller is extremely handy at place where we have to controlled the on & off switching of the device but not wired connection to that place is available. [2]

In A smart-box as low-cost home automation This paper presents an electronic device named smart box as low cost and feasible home automation solution. The smart box receives the load scheduling and hourly sends commands to local scheduler load through an existing home automation Systems. [3] In Smart home automation using Voice Recognition There has been much development in studies and research about home automation, which is also known has Demotics and for special need person such as elderly, home automation for them usually called Assistive demotics. [4]

In GSM Based Home Automation Using Arduino. It is primarily designed for making and receiving calls & text messages, but it has become the whole world after the Smart phone comes into the picture in this project we are building a home automation system, where one can home appliances using the gsm based phone. Just by sending SMS through his phone the old GSM phone needed to switch on a d switch off any electronic home appliances. [5]

In Wireless Home Automation using ZigBee. Home automation Systems must comply with the house hold standards and convenience of usage. This paper details the overall design of a wireless home automation systems. (WHAS) Which has been built and implementation. The home automation system so intended to control all the lights and electrical appliances in a home or office using voice commands’ system has been tested and verified.it include voice recognition response test using ZigBee. [6]

In Smart Home Automation through E-mail using Raspberry Pi and Sensors. This system includes sensors like gas, temperature and pir. for controlling electrical appliances, we need to send email to the home automation account and the system switch on the electrical appliances. Or if system detect gas leakage in room then send email to the users account. And if unauthorised person is detected in room then email send to the user. [7]

In Vision Based Hand Gesture Recognition For Real Time Home Automation Application In this project electrical appliances control using some hand gesture. [8]

In Home automation using PLC And SCADA Home automation is an integral part of modern lives that help to monitor and control the home electrical devices as well as other aspects of the digital home that is expected to be the standard for the future home. [9]

In Implementation of LI-FI Technology for
Home automation and vehicle communication
Here Li-Fi technology works on simple digital principle which is nothing but led is ON a digital data 1 can be transmitted and if it is of then digital data is 0 can be transmitted. [10]

III. PROPOSED SYSTEM

![Block Diagram of the System](image)

Figure: 1. Block Diagram of the System

The ability to control all electrical appliances using Arduino Controller. The System consist of number of sensors and relay module and speech recognition module. block diagram of the designed system is given in Fig 1.

Home Automation System is an emerging technology and also a need of today. The main objectives of home automation are Controlling, management and coordination of home appliances in a comfortable, effective and secure on the other hand, Artificial Intelligence is evolving as a technology for developing automatic systems that can perceive the environment, learns from environment, and can make decision using case based reasoning. With the introduction of AI to home Automation, the living space of the user can be controlled without the touch of a button. Due to the growth in the number of elderly people, it is predicted that in 2050 there will be no more than 1.4 people in the workforce for every one person outside of the workforce. Thus, the system Proposed is to cater for people in such diverse domains as home automation and health. The aim is to conceive a system that Understand their environment and, without being invasive, are capable of self-adaptation.

Modules:

1) Bluetooth module- This module is used for sending a voice command to the Arduino board with the help of android app we can make connection of app to the Bluetooth module (HC05).

2) Relay Module – A Relay is used for controlling high voltage electrical appliances like light or fan. without relay module we cannot control high voltage appliances.

3) PIR SENSOR - PIR sensor detects a human being moving around within approximately 10m from the sensor. In our project this module is used for the detecting human motion in the room and send signal to the Arduino board.
3) Light Intensity Sensor -
Light Intensity sensor provide light intensity of the room and send to the Arduino.

4) Arduino Board -
Arduino is a backbone of this project; Arduino board collect all data from the components and decide whether turn on or turn off electrical appliances. in Arduino digital pin no 7 provide output for the PIR sensor and

5) Humidity sensor - This sensor is used for measure the humidity and temperature of the room and send the values to the Arduino board.

IV. RESULT AND DISCUSSION

In figure 3 when light intensity of the room is greater than 30 and motion is not detected then LED is off.
In Figure 4 when motion detected and light intensity of the room is less than 30 then LED is on.

In this project we control Home appliances using some smart technique like checking the movement of the person in the room or checking light intensity of the room or temperature and humidity of the room. Using some condition, we will decide turn on or turn off of the electrical appliances. Main aim of this project is conserve the electricity and its very necessary for current situation.

From this discussion it is clear that AI is emerging as a very useful and applicable technology for home automation. On other hand, home automation systems provide AI a vast range of Application

**REFERENCES**


IV. “Implementation of smart Home Automation System through E-mail using Raspberry pi and sensors” [IJREEICE]

V. “TOUCH SCREEN BASED HOME AUTOMATION SYSTEM” Manohar Waghdhruvshab Gadhari2

VI. “Implementation of LI-FI Technology for Home automation and vehicle communication” K.Kalidhas, Jerin Ninan, Jubin Mathew Chack


