

# Home Automation System using Artificial Intelligence

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**Abstract**— In this paper we will be discussing about Artificial intelligence in Home automation system. It is normal to forget some important things in home just like some time we forget to OFF the switches of the appliances at this situation the home automation is useful concept for us. For a smart and intelligent home it is important to use Artificial Intelligence with the Home Automation System. To implement Artificial Intelligence in Home Automation IoT (Internet of Things) is used. Internet of Things (IoT) platforms allowed us to gather huge amounts of perceiving data. The idea behind that is to access the Home remotely through the internet. The main feature of this system is to control the energy levels of home usage like speed of fan based on temperature, intensity of light and another feature that get the prestige of our home appliances from our android mobile phone.

**Key words:** Android, IoT (Internet of Things), Home Automation, Automatic Switching

## I. INTRODUCTION

Although home automation today is not a new thing but most advanced home automation systems in existence today require a big and expensive change of infrastructure. This means that it often is not feasible to install a home automation system in an existing building. This system that is supposed to be implemented in existing home environments, without any changes in the existing infrastructure. Let the user to control his home from his or her android smart phone. In the smart phone application the user can select actions what should happen with electrical and/or electronic devices in the network. In the present day, security systems play an important role in the protection of lives and investment. This is achieved by the incorporation of various subsystems into the security system with a single control unit such as surveillance, intruder control, access control, fire detection, etc. A smart home is one that is equipped with lighting, heating, and electronic devices that can be controlled remotely by smartphone or via the internet. An internet based home automation system.

Focuses on controlling home electronic devices whether you are inside or outside your home. Home automation gives an individual the ability to remotely or automatically control things around the home. A home appliance is a device or instrument designed to perform a specific function, especially an electrical device, such as a refrigerator, for household use. The words appliance and devices are used interchangeably. Automation is today's fact, where things are being controlled automatically, usually the basic tasks of turning ON/OFF certain devices and beyond, either remotely or in close proximity. Automation lowers the human judgment to the lowest degree possible but does not completely eliminate it.

The concept of remote management of household devices over the internet from anywhere, any time in the world today can be a reality. Assume a system where from the office desk, the user could view the status of the devices

and decides to take control by tuning his TV set to his favorites channel, turns on the cooling system, say the air conditioner, and switches ON or OFF some of the lights.

This user could walk back home and only find a very comfortable, pleasant home. Home automation aims the orchestration of digital devices to provide users with real comfort together with security and ability to monitor multiple dwellings [1].

## II. RELATED WORK

There are so many systems developed for controlling and monitoring home appliances. Home Energy Management System is a part of smart grid on the consumption side, this system collect data from home appliances using smart meters and sensors, and then to optimize power supply and management by using this information [2]. As HEMS is used to reduce and manage home energy use but it cannot able to figure out how efficient a home appliance is compared to others, so it is important to compare the energy usage of home appliances to that of same kind of home appliances thus GHEMS is introduced, GHEMS checks the relative energy efficiency of his home appliances into more energy efficient one or replace energy inefficient home appliance into an energy efficient one [5].

## III. PROPOSED SYSTEM

The system allows the user to control home appliances from a smart phones with the help of Wi-Fi, Voice recognition system and can also be controlled from anywhere in the world using an internet. This system has a capability to control our appliances within our home from an Android device. The smart phone has primary control over all the home appliances. The Smartphone and PC all were trying to control the system at the same time. The project was tested to switch appliances on and off such as: lights, fan, motor and AC. The system keeps on refreshing on the Smartphone and PC every time the user chooses an option to control or monitor a specific unit [4]. The appliances are also controlled by user's voice, this is done due to speech recognition programs that work using algorithms through acoustic and linguistic modeling. Acoustic modeling signifies the connection between linguistic units of speech and audio signals and language modeling matches the sounds with word sequences to distinguish between words that sound similar [3]. This application can enable the user to speak to their home appliance through their smart phone the application have their words converted into text via word processing and voice recognition.

## IV. DESIGN & IMPLEMENTATION

This paper presents the overall design of Home Automation System with low cost and wireless remote control. This system is designed to help and provide provision in order to fulfill the needs in home. This system implements wireless

Android technology to provide remote access from smart mobile. The design replaces the existing electrical switches and provides more safety control on the switches with low voltage activation method.

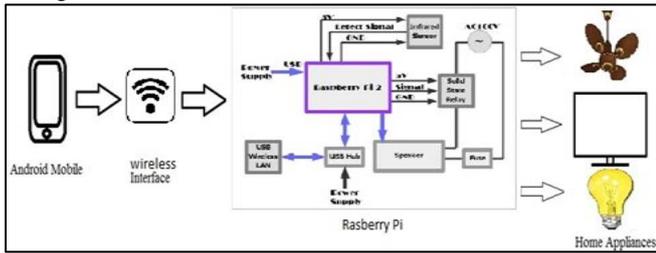


Fig. 1: Proposed System of Home Automation

#### A. Required Sensors

##### 1) LM35

The LM35 temperature sensor is used to detect the temperature levels in our home. The advantage of LM35 sensor is its low cost and highest sensitivity between +2 C and +250

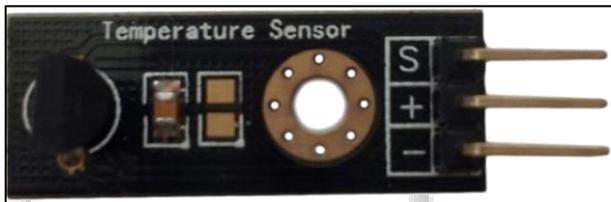


Fig. 2: LM35 Sensor

##### 2) Rain Sensor

The Rain sensor is a simple tool to detect rain. This sensor can be used in measuring rainfall and it works a switch when raindrops fall on the sensor board.

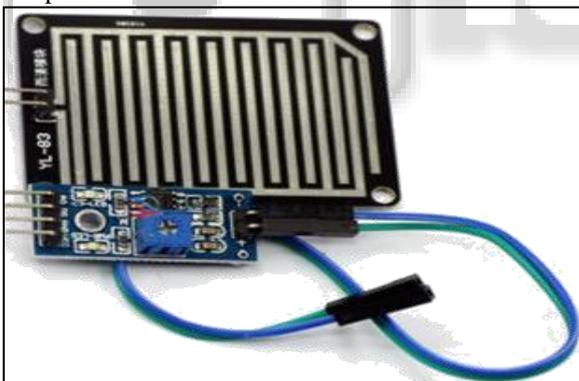


Fig. 3: Rain Sensor

##### 3) Motion Sensor

A motion sensor is a device that detects moving objects. Such a device is often unified as a component of a system that automatically performs a task or alerts a user of motion in a region. They form a fervent component of security, automated lighting control, home control, yields energy proficiency, and other systems.

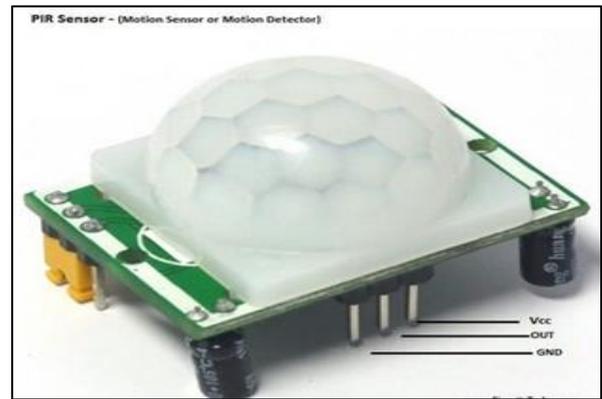


Fig. 4: Motion Sensor

##### 4) Smoke Sensor

MQ-2 Sensor detects H<sub>2</sub>, LPG, CH<sub>4</sub>, CO, Alcohol, Smoke, Propane and other flammable gases. Output can be used to trigger relay, read by a microcontroller.



Fig. 5: Smoke Sensor

#### B. Controller

Raspberry pi b+ model is the core of this system. It receives its input from the signal conditioner. The RPi 3 will be interfaced with an external memory card for storing the database of the users and for storing the speech to text files. The controller will be linked to the online internet server for accessing the data fed into the server by a family user from any place on the globe. The RPi 3 is provided with 4 USB ports, one ETHERNET port, memory card, microphone, speaker and HDMI interfaces.

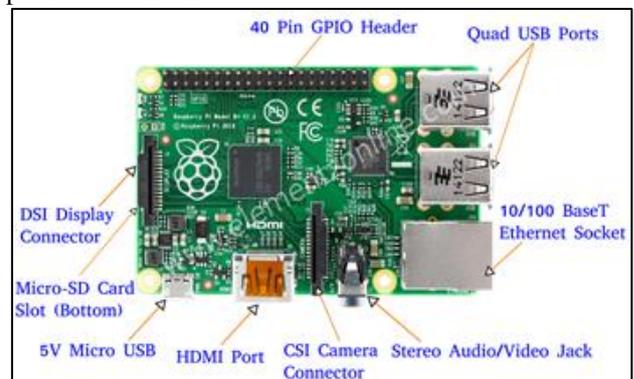


Fig. 6: Raspberry PI

## V. CONCLUSION

Thus by implementing this project we create a smart Home. Also sometimes in our busy and hectic schedule we forget sometimes some very important things that drags us into situations that we don't want to. Thus we proposed an Artificial Intelligence and IoT based Reminder system that will not only remind us about anything but also will keep us updated with recent news, alerts and also will help us maintain our work flow. The proposed system uses Artificial intelligence for visual perception, speech recognition, decision-making, and maintaining reminders. IoT has made it globally accessible.

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