SMART HOME USING TINKERCAD

T Chacrapani [1] , M.Shivani [2] , K.Deepthi[3], K.Renuka[4], N.Tejamma[5] K.Mounika[6]
1Asso Prof, Dept of ECE, St. johns college of Engineering and Technology, Yemmiganur, AP, India.
2,3,4,5,6 UG Scholar, Dept of ECE, St. johns college of Engineering and Technology, Yemmiganur, AP, India.

Abstract

This paper describes about the smart home using sensors by the software Tinkercad. In the IoT home automation ecosystem can control devices like light, door etc. A domestic automation system can monitor and manage home attributes adore lighting and appliances. Now a days most home automation systems consists of a smart phone and microcontroller. The experiment has been demonstrated with the environment which is programming commands to control the home appliance devices through Wi-Fi and the Internet. The users can control the on/off switch in the connected devices by both methods of command. Due to the rapid development in the field of the automation industry, all aspects. The modern home automation system gives security and blissful life at residence. This smart home implemented using the Tinkercad software. The people can develop the system for their home with the effective cost of implementation

Keywords

Arduino UNO, Tinkercad, PIR sensor, Ultrasonic sensor

1. INTRODUCTION

Home is the most indispensable idea and construction ever made in the history of human civilization. Throughout the ages, human houses have undergone many transformations right from small huts to modern smart homes [1,2]. Every transformation is made to get advanced facilities. Present-day homes are well developed with the best design, construction, facilities, etc. with modern civil engineering techniques. In the era of technology, every field of the world is striving to incorporate technology and automation to make their things smart and advanced [3,4]. Similarly, it is also most necessary to make homes smart since the habitat of human beings is their homes. In this generation, houses are well equipped with electronic gadgets to perform the regular tasks efficiently, smartly especially automatically. So, without the efforts of humans, all the tasks can be performed automatically instead of doing them manually [5,6]. A house can be said as perfectly automated when both the interior and exterior of the house is automated [7]. The main aim of Smart exterior home management system is to make the exterior of a home automated technically. Instead of putting much effort to perform the tasks, they will be done automatically by using smart techniques. Different kind of sensors, actuators, and hardware components along with the software is used to finish this paper.

II. PROPOSED METHODOLOGY FOR HOME MANAGEMENT SYSTEM

The block diagram of the Smart exterior home management system is illustrated in figure 1. The heart of the proposed system isArduino Uno. Which is connected to four sensors to monitor the exterior conditions of the home such as ultrasonic sensor, Passive Infrared (PIR) sensor, and

photodiode. The Arduino Uno is also connected to four actuators such as DC motor, Light emitting diode (LED), servo motor, temperature sensor and buzzer.   The following subsections describe the methodology of the proposed system [8,9].
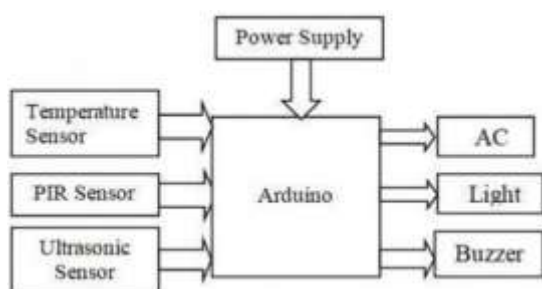

figure 1: Basic Block Diagram

Idea 1 of the Smart home management system is illustrated in figure 2. the main aim of idea 1 is to measures the distance of an object using ultrasonic sound waves.
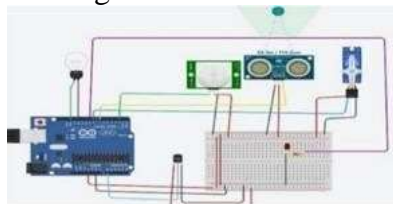

figure 2:Circuit Diagram Using Ultrasonic Sensor after stimulation.

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. If the person far from the door means more than 100cm the door will close. Here the person is less than 100cm near to the door so the door will as the servo motor turn 90 degrees.

Idea 2 of the Smart home management system is illustrated in figure 3. the main aim of idea 2 is to measures air, liquid and solid temperature. A temperature sensor is a device used to measure temperature. This can be air temperature, liquid temperature or the temperature of solid matter. There are different types of temperature sensors available and they each use different technologies and principles to take the temperature measurement.By varying the temperature intensity in slide bar as shown in the above figure. If the temperature is high then LED will glow. The temperature islow the LED will turn off.
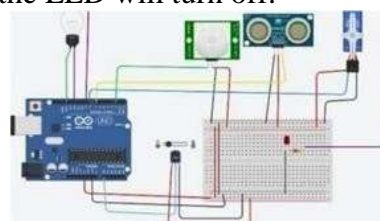

figure 3:Circuit Diagram Using temperature Sensor after stimulation.

Idea 3 of the Smart home management system is illustrated in figure 3. the main aim of idea 3 is to measures air, liquid and solid temperature. A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. PIR sensors are commonly used in security alarms and automatic lighting applications. PIR sensor is used to detect the movement of objects we use this sensor for home security. Suppose any person movement is detected the bulb will glow for sometime
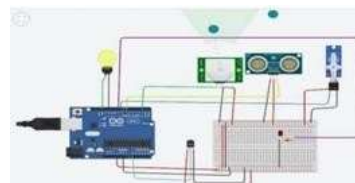

figure 4: Circuit Diagram Using PIR sensor after stimulation.

III. CONCLUSION

The main objective of the smart home management system is about ensuring the

user an effortless and simplified task. The project has proposed the idea of smart homes that can support a lot of home automation systems. A smart home contains a connection between wireless communication, sensors, monitoring and tracking. Smart homes are a huge system that includes multiple technologies and applications that can be used to provide security and control of the home easily. Also this project showed the idea of making a navigator in the home to measuring the temperature in all rooms and to detect any motion in the home by using ultrasonic sensors. These designs were for access control to the home, temperature validation,and control board system to connect all the security and control circuits together. Usage of IoT applications to develop smart home systems has been a popular field of research in recent years, and the extent of its application could go on increasing. It is necessary to incorporate as many features as possible to develop a system that can automate and control all the appliances in the house but it is also essential to design efficient systems to reduce usage of electricity, hence adding features such as controlling the intensity of lighting can reduce the amount of power consumption by such appliances. In this project, a prototype to control some of these home appliances was developed, these features were tested and demonstrated successfully.

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