

Smart Home Automation using IOT and Arduino

Ankit S. Soni, Amit J. Nayak

Abstract: Innovations which are the key features to enrich society and make daily routines simple and secure. Over the last decade, Technology has progressed in every field immensely with the help of it nowadays you can build a highly automated dwelling with integrated appliances controlled by a mobile phone. With Rapid progress in smart home systems people got influenced and have updated themselves to it which includes Door lock/unlocking with keypad, fingerprint touch and also access from a mobile app, Lights turning ON/OFF and Fans which are controlled from any corner of the world.

Index Terms: Home Automation, Internet of Things, Arduino, Door Lock System, WIFI, Light Control.

I. INTRODUCTION

In this modern era, life of a person is extremely occupied and they need to finish in quick time from that we have come up with idea of smart home system which will be helpful to accomplish task i.e. turning light ON/OFF and Door Unlocking/locking with more secure and Efficient using Wi-Fi and Internet of Things. Smart Home Automation means that to discover a technological way, which leads you to develop a system with some innovation by which you control Home appliances. In this project the features which are implemented controlling lights of a room via android app using IOT and door locking / unlocking using fingerprint detection or keypad as well as from android app which are control from any corner of world.

II. RELATED WORK

He have presented plan and usage of a low cost, adaptable and wireless solution for the home computerization. The system is secured for access from any client or intruder. The clients are required to acquire matching password for the Arduino B Tand the wireless to get to the home appliances. This adds a protection from unauthorized users. This system can be utilized as a test bed for any appliances that require on-off switching applications with no web association. Range was observed to be restricted to <50m in a building and most extreme of the 100m ranges was accounted for to be applicable in an open range [1]. Researchers tended to control of device utilizing Bluetooth and internet/wired. Analysts have utilized a different kind of microcontroller to control the appliances. Generally, individuals forget to turn off the lights. Monitor the individual heartbeat, when individual rest, heart rate drops to 45-55 bps. In the event that the heart rate lies between the reaches, we can consequently turn off the lights, which are, connected to the mobile [2].

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This work introduces a security system, with GSM mobile communication support, for smart home automation. The proposed system is compared with related integrations in the field. Added security with help of GSM if some unauthorized person try to access and input wrong password it will send sms and notify to them and camera will capture person image and store in cloud [3]. They have presented a home security which detect the motion of human using PIR sensor and the owner will receive a call when human is detected if there is any intruder trying to enter then owner will say yes and alarm will turn on at home and if he says no then he can able to control lights using keypad via IOT [4]. The home automation utilizing the Internet of Things has been tentatively demonstrated to work by associating appliances with it and the appliances were effectively controlled remotely through the web. The composed system not just monitor the sensor information, similar to temperature, gas, light, movement sensors. For example, switching on the light when it gets dull. It additionally stores the sensor parameters in the cloud (Gmail) in an auspicious way. This will help the client to analyse the state of different parameters in the home whenever anywhere [5]. These people have deal with GSM as well android application to turn on appliances with human detection whenever a human gets detect it gives sms alert to authorized person and then turn on appliances if there is authorized person otherwise it will turn on alarm [6]. Develop a Bluetooth based home automation using android application where the range is limited to 100 meters using arduino mega and cytronbluebee [7]. In this paper they have discussed how to control door lock, lights and fans using Android application via Bluetooth and generate sms alert when intruder enter wrong password 3 times [8].

III. PROPOSED SYSTEM

In This paper you will be guided to develop a home automation, which brings unique functionalities to IOT world. Smart Home Automation means that to discover a technological way, which leads you to develop a system with some innovation by which you control Home appliances. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Automation plays vital role in our life is also called extension of home that saves time, energy and operate appliances without moving closer to it. Controlling lights of a room via android app with IOT and door locking/unlocking using fingerprint detection, keypad and from android app.



Wireless communication between android application and Nodemcu will be done with help of Thingspeak Server. The 2-way door lock system works on Arduino Mega and Fingerprint Sensor and Keypad are connected to it so whenever there is correct match of fingerprint or password 1st lock will be unlocked and it is mandatory to input pass code correct from android smartphone to unlock 2nd Lock as this provide more secure and safe wireless Door Lock System.

IV. ALGORITHM OF PROPOSED SYSTEM

Arduino is an open-source electronics platform based on C and C++ language easy to use hardware and software. Figure 1 describes how light will be control Home appliances are operated with android application whenever you press button ON it will send https request to thing speak server and a simple chart is display with the value is 1 and from the thing speak server using nodemcu you fetch the value 1 for light ON and 0 for Light OFF respectively it will work according to it. There should be Wi-Fi available at home otherwise you wont be able to control wireless communication between android to appliances. Nodemcu which already has inbuilt ESP8266 Wi-Fi module which require 5V input supply from Battery and connected to Wi-Fi thereafter relay board which require 5V input from battery which helps to handle 220V to control bulb.

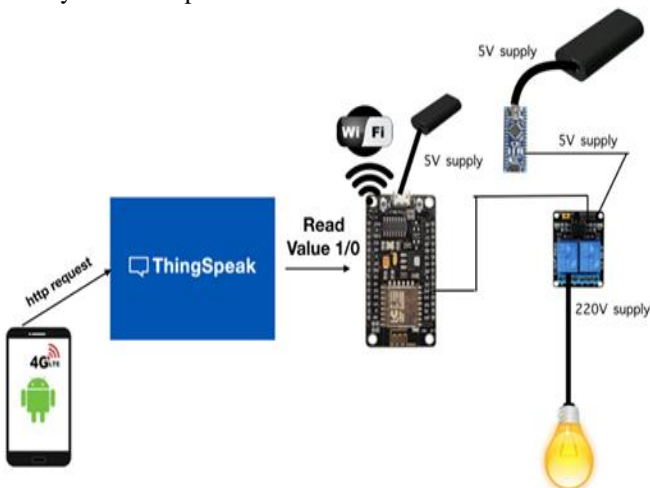


Fig. 1: Light Control

Figure 2 describes about 2-way Door Lock System that consists of fingerprint detection, keypad dial and passcode from android application. In this you require fingerprint sensor which is more secure only authorized person can access which is integrated with keypad lock and if any one of the two get correct it will unlock first lock and for second lock to unlock you will definitely require passcode from android application. It is more secure then above existing system because when any intruder tries to access from keypad and on doing 3 wrong attempt keypad will get disable and wont unlock and after that to unlock both the locks you will need authorized person's fingerprint as well as pass code from android app.

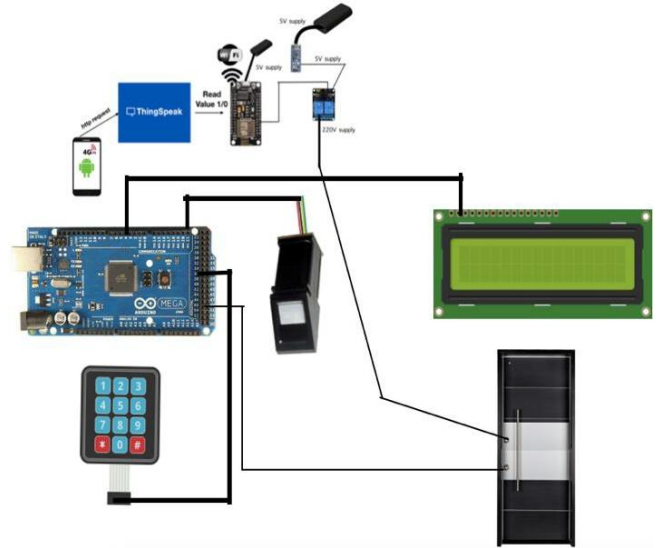


Fig. 2: Door Lock System

Channel Stats

Created: 3 days ago
Updated: 3 minutes ago
Last entry: 3 minutes ago
Entries: 24

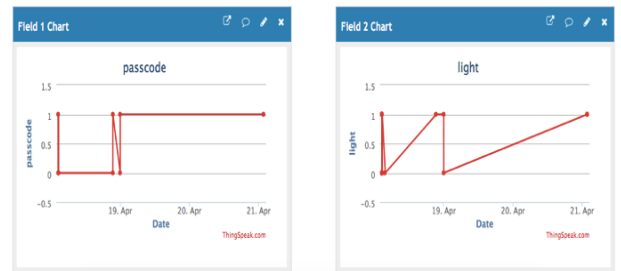


Fig. 3: Thingspeak Chart Generated from Android app Signal

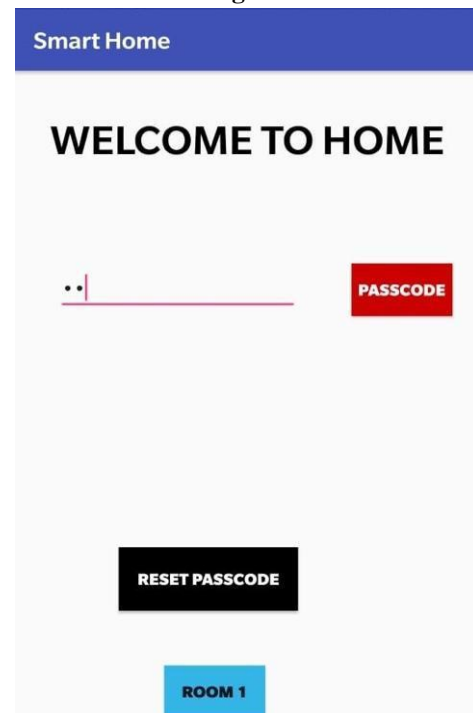


Fig. 4: Android App Passcode Unlock for Door

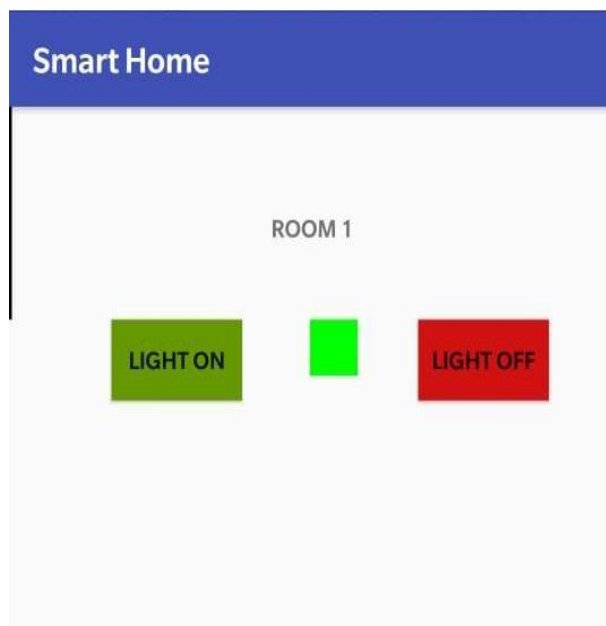


Fig. 5: Android App Light Control

V. CONCLUSION

Here we conclude that with help of increasing technology one will overcome security issues and manual work to turn on/off lights and fans depending upon a person necessity he/she can be able to modify modules. Transforming from traditional to modern tech essential to remain updated with world and is control with tiny equipment called mobile phone from your current position.

ACKNOWLEDGMENT

In this paper the system which is developed will be helpful to all the generation they will be able to operate lights and unlock door via android application and secure Door Lock System with hybrid combination of keypad, fingerprint and passcode lock control from anywhere.

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