

## A Review Paper on IoT Based Smart Security and Home Automation

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### ABSTRACT

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Recent advances in smartphones and affordable open-source hardware platforms have enabled the development of low-cost architectures for Internet-of-Things (IoT)-enabled home automation and security systems. These systems usually consist of sensing and actuating layer that is made up of sensors such as passive infrared sensors, also known as motion sensors; temperature sensors; smoke sensors, and web cameras for security surveillance. These sensors, smart electrical appliances, and other IoT devices connect to the Internet through a home gateway. This project is based on implementation of an IoT based home security system, to be able to control entrance from anywhere in the world is the major aim of this project and at same time it should be secured, and this was achieved with the use of Internet of things and some other electronics components. An automatic door control system working through a mobile app and also through a keypad was achieved. IoT refers to the infrastructure of connected physical devices which is growing at a rapid rate as a huge number of devices and objects are getting associated with the Internet. Home security is a very useful application of IoT and we are using it to create an inexpensive security system for homes as well as industrial use.

**Keywords :** IOT, Arduino, Node MCU , WI-FI, Smart phone

### I. INTRODUCTION

Security and safety are one of the major issue or challenges facing all human on earth today, we are now headed into the second decade of the 21st century, we are now witnessing more and more digital devices all around us in our daily life, they indeed influence our routine living and we cannot even Imagine one single day without using them, that is why IoT base home security system is indeed a timely project.

Technology has evolved over the years to present a very effective system these days which can turn some of the security agencies green with envy. In this time of increasing crime and theft, it has become imperative to safeguard your house with adequate safety devices. Installing an IoT home security system can go a long way in providing protection against thieves and Intruders.

We all want to feel secure; we all want to secure our life, our family and our resources. This project provides an essential measure of security needed to safeguard the needed resources. The overview of the project involves the use of a solenoid lock connected to the Arduino board to open and close the doors and gate. A 4\*4 keypad will be used in other for the user to manually input and override the security code (password or pin), all this and other necessary information will be displayed on a 16\*2 LCD Screen, both the keypad and the screen will be connected to the microcontroller. Through the Wi-Fi module, this we allow the user to get access to the light anywhere, anytime, provided there is a network connection.

The system also sends the temperature and humidity data to the cloud server and we can see the data in the form of a graph online. Also if the gas is detected then the exhaust fan automatically turns ON. The door has the touch sensor if the door is locked and someone wants to open it so by the touch sensor the buzzer will ring

### 1.2 Problem Definition

Most apartments can only be controlled at the entrance alone, this project seeks to exploit how IoT can be used to control houses from anywhere in the world.

### 1.3 Aim and Objectives

The aim of this project is to develop an IoT based home security system.

The objectives are:

Control light with a IoT; and electromagnetic locks using keypad Perform password verification using a keypad.

## II. LITERATURE SURVEY

IOT Based Smart Security and Smart Home Automation

The Home Automation can be implemented using different types of wireless communication techniques such as ZigBee, Wi-Fi, Bluetooth, GSM, etc. These existing methods have drawbacks as they work in short range. To overcome this drawbacks, we are going to implement this project “IoT based Smart security and Smart Home Automation”. The project focuses on controlling lights and fans referred as Home Automation and providing Smart security by sending an captured image through anail to the owner using internet when an object is detected. By using “Node MCU” Module we are going to implement this project. This will be more helpful for Handicapped and aged people.

HOME SECURITY SYSTEM USING IOT Design and Implementation of an IoT-Based Smart Home Security System

Iot-based Integrated Home Security and Monitoring System

Iot Based Smart Wireless Home Security Systemt

### BLOCK DIAGRAM

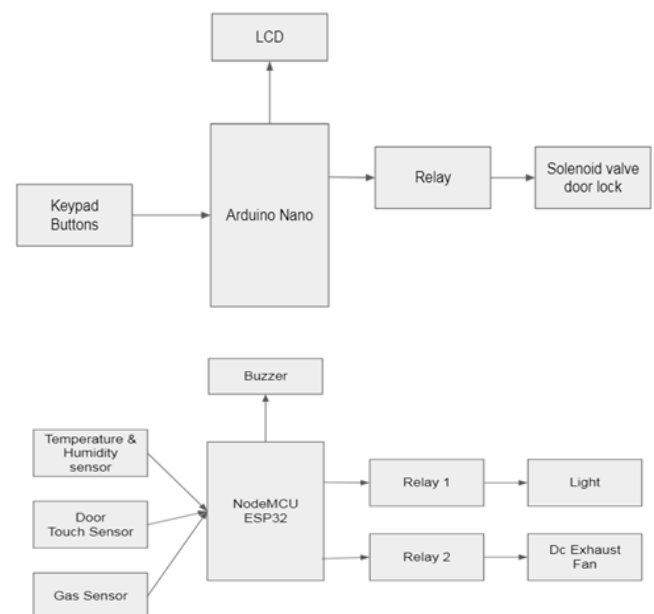


Figure 1. IoT Architect Block Diagram

### III. METHODS AND MATERIAL

#### WORKING

Touch sensor for door is activate buzzer if door is locked and someone wants to open it LPG Gas sensor activate Exhaust FAN and Buzzer (For kitchen) Online from website we can turn ON / OFF light Data of room Temp and Humidity , gas and door touch will send on iot database Temperature and Humidity data we can plot graph online Code lock is use for door open Cloud is the heart of any online system; it is like a central server focus mainly on implementing services without the need of physical hardware. The centralized controller connected with the device sends data generated from our homes and evaluates it and send current data of temperature and humidity on the server. The main benefit of this system is that it uses mobile or computers to control Light functions while sitting anywhere in the world. Globally these types of systems installed in home is called an automated or smart home. This system is also very useful in energy consumption. The proposed system consists of servers, WIFI modules and sensors. The main sensor board which will run all operations and connect our sensors to cloud here is Arduino a small programmable computer board with inbuilt Wi-Fi module which will work as a server.

The security code lock is use for door operation authentication . Kitchen gas leakage detection is done automatically and exhaust fans are turn on Main Hardware components

#### 4.1 NodeMCU

ESP32 Based Microcontroller 16MB memory 32bit controller 2.4GHz wifi connectivity 18 Analog & Digital Pin Program via Arduino IDE It use to send the data to internet server.



#### 4.2 Arduino Nano

Arduino NANO is the open source smallest Embedded Development board launched by Arduino based on Atmega328 SMD Package Microcontroller Specifications:-  
•Microcontroller Atmel ATmega328 SMD Package  
•Operating Voltage (logic level) 5 V  
•Input Voltage (recommended) 7-12 V  
•Input Voltage (limits) 6-20 V  
•Digital I/O Pins 14 (of which 6 provide PWM output)  
•Analog Input Pins 8  
•DC Current per I/O Pin 40 mA  
•Flash Memory 32 KB (of which 2KB used by bootloader)  
•Clock Speed 16 MHz.



#### 4.3 Relay

5 Volt DC Single Pole Double Throw Relay Supports 250V AC / 10Amp Supports 110V DC / 15Amp



#### 4.4 LCD

A rduino IIC/I2C interface was developed to reduce the IO port usage on Arduino board 16 characters

wide, 2 rows Single LED backlight included can be dimmed easily with a resistor Supply voltage: 5V



4.5 DHT11 sensor

Temperature & Humidity sensor Power Supply : 3.3~5.5V DC Measurement Range: Humidity 20-90% , Temperature 0~50°C Accuracy: Humidity +-5% , Temperature +-2°C Resolution: Humidity 1% , Temperature 1°C



4.6 MQ9 Gas sensor

MQ-9 gas sensor module has high sensitivity to Carbon Monoxide, Methane and LPG. Sensitive material of MQ-9 gas sensor is SnO<sub>2</sub>, which with lower conductivity in clean air. It makes detection by cycling high and low temperature, and detects CO when low temperature (heated by 1.5V).



4.7 Touch Sensor

Low power consumption Power supply for 2 ~ 5.5V DC Power supply voltage(VCC): 2.0, 3, 5.5 V. Output

high VOH: 0.8VCC V Output low VOL: 0.3VCC V Response time (touch mode) : 60 mS Output Pin Sink Current (@ VCC = 3V, VOL = 0.6V) : 8 mA Output pin pull-up current (@ VCC = 3V, VOH = 2.4V) : 4 mA Response time (low power mode) : 220 mS



4.8 Buzzer Operation Voltage: 3-5V DC Current: <25mA SPL: 85dBA/10cm Frequency: 2,300Hz Color: Black

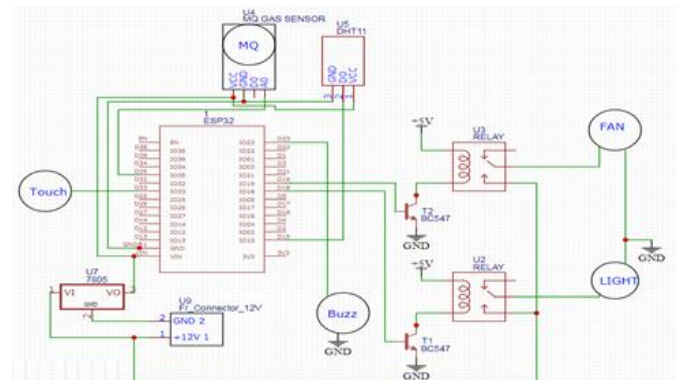


IV. RESULTS AND DISCUSSION

Software Use

For PCB design : easyeda.com online PCB design tool For Controller Programming : Arduino IDE software is use

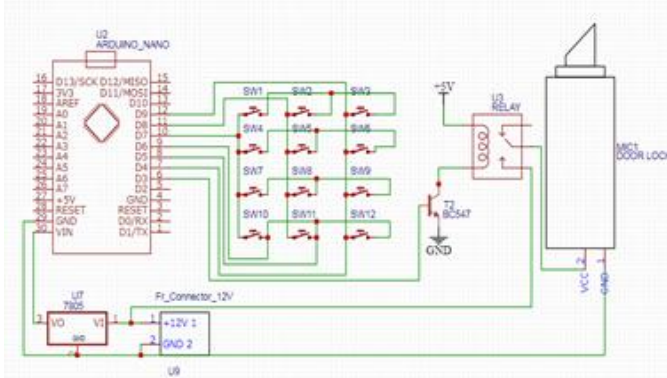
Circuit Diagram of IOT



DHT 11 connected to pin 15 Relay 1 and 2 connected to 18 and 19 Buzzer is connected to 23 Touch sensor

pin is 33 Gas sensor connected to pin 35 12V supply given to 7805 to convert 5v for esp32 supply input Fan and Light connected to relay.

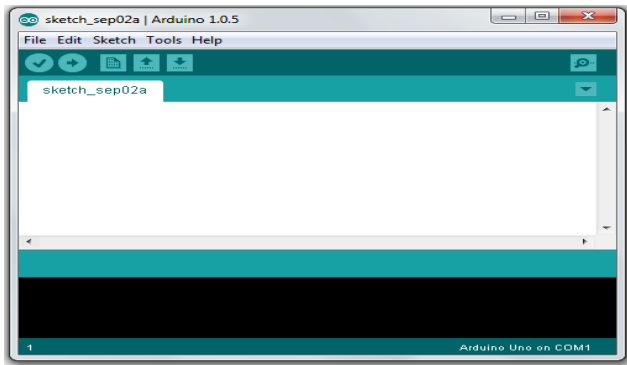
### 6.1 Circuit Diagram of Door Lock



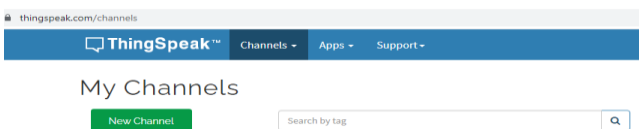
Nodemcu pin 4,5,6,7,8,9,10 are connected to switch keypad 4 Row and 3 column Relay is connected to pin 3 Door lock connected to relay 12V supply given to 7805 to convert 5v for Arduino nano supply input

### Thingspeak

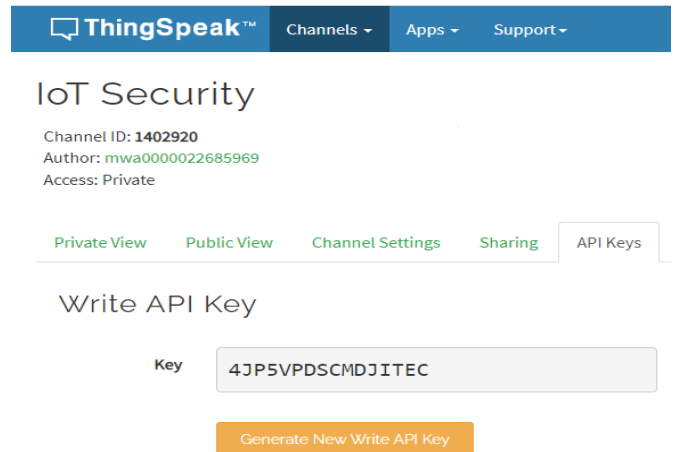
After login it will ask channel creation



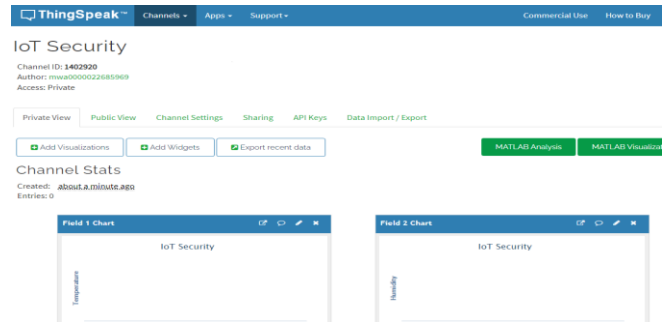
### Channel Creation



API key for my channel



### Channel Field



## V. CONCLUSION

Home automation has taken us too far from traditional ways and increased advancement has led us to use our homes and devices to the optimum level. Future homes will most likely offer practical and advanced security to its owners and revolution in smart homes is made possible through IOT Digital code lock security is provided as an advanced feature. If the Gas leakage detected then exhaust fan started automatically.

## VI. REFERENCES

[1]. Kushank Sehgal Amity University, Noida, "Iot Based Smart Wireless Home Security Systems", Proceedings of the Third International Conference on Electronics Communication and

- Aerospace Technology ICECA 2019IEEE Conference Record # 45616; IEEE Xplore ISBN: 978-1-7281-0167-5
- [2]. Taryudi, Davin Bagas Adriano, "Tot-based Integrated Home Security and Monitoring System", IOP Conf. Series: Journal of Physics: Conf. Series 1140 (2018) 012006
- [3]. B Bohara and S Maharjan 2016 IoT Based Smart Home Using Blynk Framework (Zerone Sch) vol 1 no 1 pp 26–30
- [4]. W Abdullah, R Mahmood and D Abdullah 2017 A Smart Home Design Based on Ethernet (Acad J. Nawroz Univ) vol 6 no 3 pp 59–63
- [5]. U Farooq, K M Hasan, F Rafiq and M U Asad 2013 An Integrated Approach Towards Designing an Embedded Wireless Monitoring and Access Control System Using RFID and MMS Technologies pp 182–188
- [6]. Seung-Chul Son, Nak-Woo Kim, Byung-Tak Lee, Chae Ho Cho, and Jo Woon Chong "A Time Synchronization Technique for CoAP-based Home Automation Systems", IEEE Transactions on Consumer Electronics, February 2016, Vol. 62, No. 1, pp. 10-16.
- [7]. Seung-Chul Son, Nak-Woo Kim, Byung-Tak Lee, Chae Ho Cho, and Jo Woon Chong "A Time Synchronization Technique for CoAP-based Home Automation Systems", IEEE Transactions on Consumer Electronics, February 2016, Vol. 62, No. 1, pp. 10-16.
- [8]. Seungho Chae, Yoonsik Yang, Junghyun Byun and Tack-Don Han "Personal Smart Space : IoT based User recognition and Device control", IEEE Tenth International Conference on Semantic Computing, 2016, pp. 182-182.
- [9]. S.Sujin Issac Samuel "A Review of Connectivity Challenges in IoT Smart Home", 3rd MEC International Conference on Big Data and Smart City, 2016.
- [10]. B. S. S. Tharaniya soundhari, M., "Intelligent interface based speech recognition for home automation using android application," pp. 1 –11, march 2015.

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