

Intelligent Home Security System Using One Time Password Authentication

L.RajaShashipalReddy, T.Koushik ,B.B.V.Satya varaprasad ,Ravi Kumar Tenali

Abstract: The home security is the most important parameter in the daily scenarios. As to provide safety is to be the main concern. The present reliable systems and its drawbacks are also mentioned such as digital lock system, mechanical door opening etc. Although these systems are introduced, the devices even broken by the intruders. The proposed designed is to maintain with high credential security with the usage of One-time password (OTP) authentication and the sequential procedure to highly secured. The step by step process performed to unlock the door is first, the user had to enter the password at the entrance, immediately the message with OTP is generated to the android phone. So, after the OTP is successfully entered, the Microcontroller activates and make the door lock open/close. In this system, the OTP is generated from the cloud through Microcontroller. This system is entirely reliable and low cost with the usage of the Internet of Things (IoT) Technology.

Keywords: One-time Password. Internet of Things, Microcontroller, cloud.

I. INTRODUCTION

Nowadays home security is one of the fundamental accreditations for the general population that must be effectively considered and be guaranteed to get better security. Home security must be included with new advancement solutions to work with automated devices based on web, interfacing the framework with the latest gadgets. At present, Smart Mobile phones are well in the usage of communication and interfacing online. and all the individuals are feeling easier to work with these systems for door lock security system. Android-based security devices for home [1], [2], [3] works with few highlights to meet the current scenario adaption for home security. [1] To trace the intruder activity at unlocking the door entry. Lock/Unlock [2] is worked using the Smartphone. security at the home is checked by using Infrared motion detecting sensor [3], which initiates and alerts the theft activities. At the point of absence of the owner, alert messages will be sent by using GSM systems [4], [5], [6]. This Design framework is simple and reliable while using in the real time. The smart system for security will be enabling using the mobile android app and the entrance of the system is activated with the One-time password. The main users will have the key ownership and the registrations are done in his authorization.

Literature Survey

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Rupam K.sharma [1] et al. proposed the entire system to be accessed using the smart phone. When the intruder enters the area without authentication immediately the owner by the use of smart home will send alert high sound.

Dhanish [2] et al. has proposed the system to initiate the high security at home by infrared motion sensor and observe the abnormal movements and alert the owner with the messages. Yanbo zhao et al. [3] proposed the security system where the infrared red sense the human activities and at the emergency fire intimation is also taken to know the situation and send the message to the surrounding help line.

Biplav Choudary et al. [4] proposed that at emergency situations. The panic button is used to send the location and as well as information to the nearby police .

Wu ping [5] proposed finger print door lock system using PSTN and GSM technology. This system is used fingerprint to lock and unlock the device. If the intruder finger doesn't match the messages are sent to the family members and alert the surrounding with the buzzer.

Mrytyunjaya et al. [6] uses the face recognition system to capture the image and transfer the image to the email or via message using GSM. So the owner will get the each visitor images and perform the activities to lock/unlock.

Cheng cai et al. [7] proposed the system using RFID and with specific card access, the door lock/Unlock is identified.

Methodology

The Methodology of the Proposed designed is presented in the following Block diagram of Fig.1

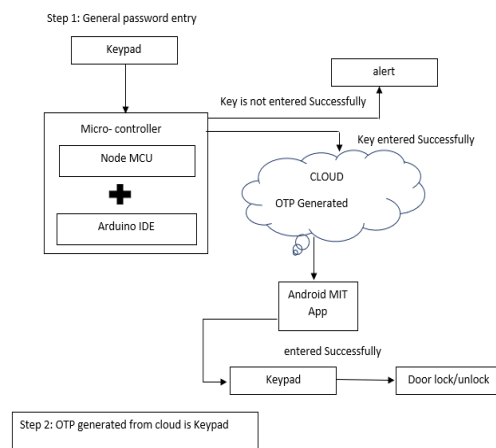


Fig.1. Methodology of Proposed design

Proposed Design

The entire process iterates in two steps to provide the High security. In step 1, the user regular password is entered in the keypad of the system and if the password is entered correctly immediately the



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microcontroller will send the One-time password to his android mobile via cloud service. In step 2, the One-time password generated from the Android app is entered in the keypad to unlock the door successfully. If the password is not entered, the system shows the invalid as status in the android mobile.

Hardware & software Co-Design

Hardware Requirements:

The following devices are used for the hardware system such as

Arduino: The Arduino Uno is a microcontroller based on the ATMEGA328 Board and it is an open source platform of Hardware/software with 14 digital input/output pins, 6 analog input/output pins. Addition the SPI/I2C/UART is also interfaced to the micro controller board. As memory 32Kb is provided in the ATMEGA. This board is interfaced to the Keypad. If the user enters the password information correctly, then the data is sent to the ESP8266 board is shown in the Fig.2.



Fig.2. Arduino IDE

NodeMCU: Node MCU – ESP8266 board is developed by Espressif company which consists of the IEEE 802.11 a/b/g/n. It is a low cost Wi-Fi microcontroller chip. In these micro controller the data is gathered from the Arduino is sent to the cloud is shown in the Fig.3.

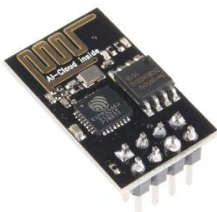


Fig.3. ESP8266

Keypad

Keypads are mostly used as user input. The 4x4 matrix keypad uses the 16 keys, but yet the 8 output pins are used in the interface to the micro controller

Buzzer

The buzzer is used to alert the system. If the password is given wrong. The buzzer is an audio signalling device which may use electro or piezo.

DC Servo motor

Dc servo motor is tiny and lightweight can rotate 180 degree approximately. Here the proposed design is used to unlock the system for entrance purpose.

Software Requirements:

The Software used to code the entire device is with Arduino IDE.

Arduino IDE: Arduino integrated development environment is used for the write the software code to running the Arduino hardware. With the use of USB to serial converter, the device is able to process the performance.

The cloud used to store the entire information is with Thingspeak.

Thingspeak: Thingspeak is an open source Internet of Things platform application which performs to send and retrieve data from the API given to the cloud.

Results

The hardware setup and the experimental results of of Intelligent home security system using one-time authentication

are shown in the Fig 4,5 and 6

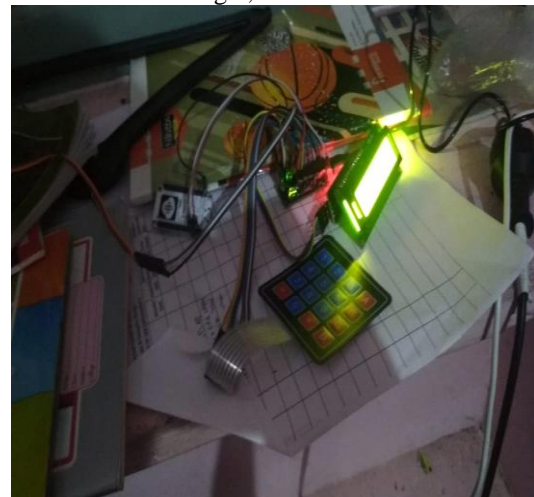


Fig.4. Hardware setup of the model



Fig.5. Result presented on the Display

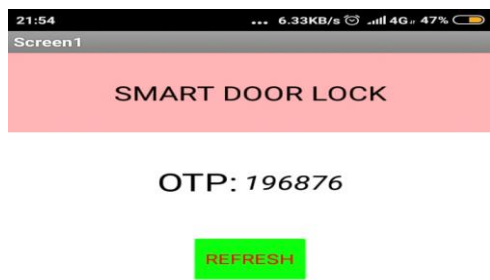


Fig.6. Data sent to the cloud

II. CONCLUSION

By using this Internet of Things application, the proposed system will have the high security to enter into the area. This device continuously work with two-way authentication and constantly alert, if the intruder enters. The system is a reliable and used in all kinds of secured applications.

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