

# OTP Based Door Lock System

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**Abstract—** An OTP-based door lock system is a modern security mechanism that utilizes unique One-Time Passwords for secure access. It comprises a microcontroller, GSM module, LCD display, keypad, and solenoid lock. The user enters their mobile number, receives an OTP, and upon successful verification, the door is unlocked. The system is cost-effective, easy to use, and can be installed in various applications for high-security levels. Overall, the OTP-based door lock system provides an efficient alternative to traditional lock-and-key mechanisms for securing access to restricted areas.

**Keywords—** OTP, authentication, smart home, security, encryption,

## I. INTRODUCTION TO OTP BASED DOOR LOCK SYSTEM

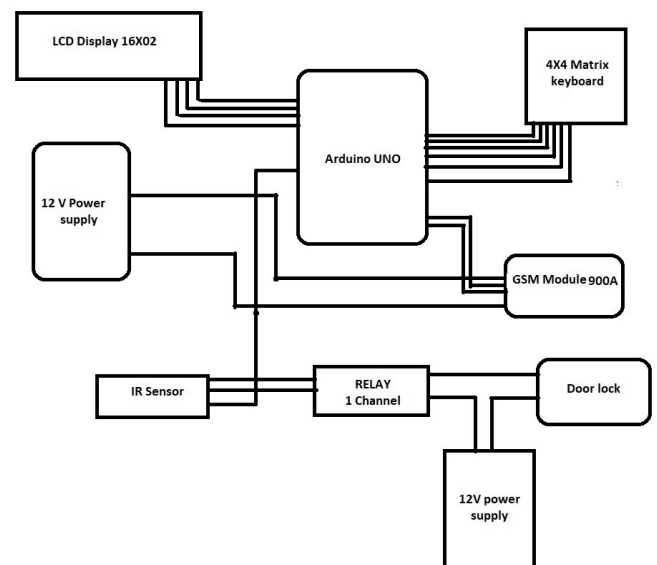
**Introduction to OTP BASED DOOR lock system** An OTP (One-Time Password) based door lock system is a security system that utilizes a unique password that can only be used once to unlock the door. It provides an added layer of security compared to traditional lock systems. The system typically involves a door lock mechanism connected to a microcontroller that generates an OTP. The OTP is usually sent to the user's mobile device via SMS or a mobile app. The user then enters the OTP into the keypad or mobile app, which sends a signal to the microcontroller to unlock the door. The advantages of an OTP based door lock system are that it provides a higher level of security since the password can only be used once, and it is easy to use since the password is sent to the user's mobile device, eliminating the need for carrying physical keys. Additionally, the system can be easily integrated with other security systems such as CCTV cameras and alarm systems. Overall, an OTP based door lock system is a modern, convenient, and secure way to control access to your premises.

## II. PROBLEM STATEMENT

This smart lock can generate a new password every time you unlock it, which further enhances your security level. This new device is much safer than the traditional key-based system and electronic wireless lock system. If you are still using the key-based system, you are likely to land

in a big problem if your key gets lost or stolen. The electronic wireless lock system is not safe either. You might forget the password and there is also a high risk being hacked. For your safety and security, we bring to you a DIY smart lock that has the capability to remove all these security threats and problems.

## III. BLOCK DIAGRAM



## IV. METHODOLOGY

The authentication technique used here could be a OTP (four-digit numeric) code generated in an Arduino microcontroller and sent to the registered mobile range through the GSM module and conjointly keep in the Arduino microcontroller's RAM, that is then entered through the computer keyboard.

- The code entered this manner is then compared to the countersign keep in memory.

- The Arduino microcontroller endlessly monitors the computer keyboard for a match with the keep counter sign.
  - As and once there's a match the output line is enabled which may then be went to run the motor.
  - Associate in Nursing liquid crystal {display| LCD | digital show |alphanumeric display}  
The display is additionally wont to display whether or not the entered countersign is correct or not.
1. The whole system is consisting of three elements.
  2. Primary half is receiving unlock command exploitation switch.
  3. Secondary half is generating a random OTP and causation it to the registered mobile range.
  4. Last half is storing the OTP and comparison the OTP and comparison the OTP entered by the user, If the OTP is correct then the door opens, If OTP is wrong then the liquid crystal {display |LCD |digital display| alphanumeric display} display the OTP entered is wrong and therefore the authentication gets unsuccessful and therefore the door can't be opened.

The functionalities of this complete OTP Based door-locking system :-

- I. The user is detected by IR Sensor.
- II. The Arduino microcontroller starts to run.
- III. OTP is going to generate and send by GSM Module.
- IV. OTP sent to the registered mobile number in the code.
- V. The user should enter the generated OTP.
- VI. Entered OTP matching with the generated OTP.
- VII. If the entered OTP is valid door will be open or else it remains locked.

## V. CHALLENGES FACED

While Developing an OTP based door lock system using Arduino uno and GSM 900A module we have faced many problem while doing this project. So we have to manage to encounter problem by step by step manner. We have faced many problem as following below

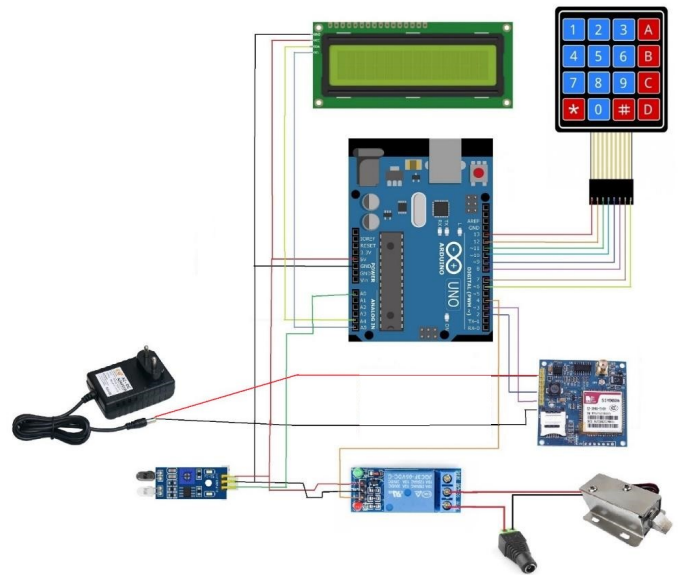
GSM issue we were using GSM 800L but it was giving the problem of range for that we replaced our GSM from 800L to 900A

After than we faced problem related to coding which was a major part of our project all but we solved it with the help of our Professor Mr. Avinash Dangwani sir he helped us for the coding

## VI. WORKING PRINCIPLE

When a person senses the IR sensor as per its range the OTP will be sent to the mobile phone via GSM (Global System for Mobile), Mobile no will be initiated in the code then as the OTP will be received with help of Keypad Matrix type the OTP then the solenoid lock will open this all procedure will be displayed on I2C LCD and will be controlled by master board Arduino UNO

## CIRCUIT DIAGRAM



## VII. WHAT ARE THE ADVANTAGES OF OTP BASED DOOR LOCK SYSTEM

- 1) Enhanced security
- 2) Convenient access control
- 3) Flexibility
- 4) Easy integration
- 5) Cost-effective

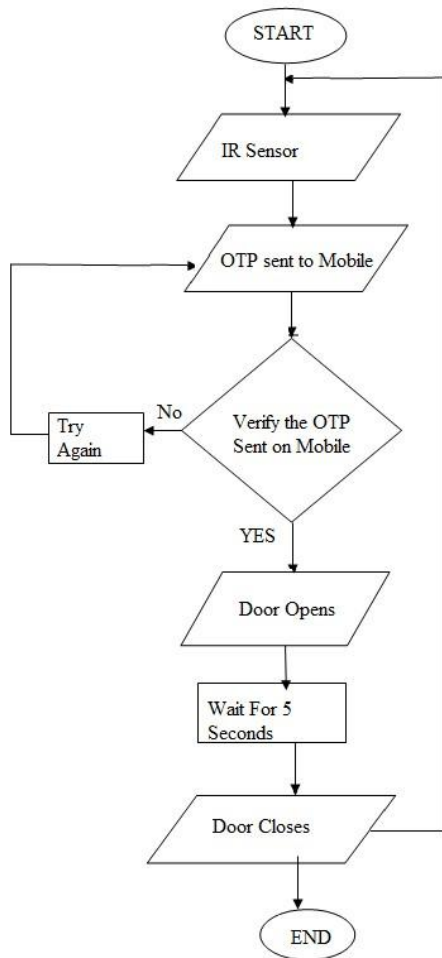
## VIII. WHAT ARE THE DISADVANTAGES OF OTP BASED DOOR LOCK SYSTEM

1. If your phone is stolen, you lose it or it dies, you could get locked out if you don't have a backup plan

## IX. APPLICATIONS OF OTP BASED DOOR LOCK SYSTEM



## X. FLOW CHART



## XI. Conclusion

OTP (One-Time Password) based door lock systems provide a highly secure, flexible, and convenient solution for access control in a variety of applications, ranging from residential buildings to commercial, educational and healthcare.

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