



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 Issue: VI Month of publication: June 2021

DOI: <https://doi.org/10.22214/ijraset.2021.35111>

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Result Analysis: Remotely Accessible Security System using IoT

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Abstract: In the today's world a strong door locking system is that the first and most important thing to assure security of a home. Due to the increasing workload and daily travelling tasks most of the days people stay out of their houses. In such situations, identifying a visitor and getting remote access to their home is necessary. A smart door lock mechanism which may be completely monitored and controlled from a foreign location using a smartphone is proposed during this paper. When a visitor presses the bell/push button at the door, a Raspberry Pi with an attached camera gets triggered and captures the image to check in the database for identification. If found then the door will simply open; otherwise, a notification will be sent to the owner with OTP and the visitor's image. Now, depending upon the owners, he/she can give access to the visitor by giving the system-generated OTP.

Keywords: Lock, IoT, Smart Bell, Raspberry PI, Home Security, etc.

I. INTRODUCTION

Opening and closing of doors is usually a tedious task, especially in places like shopping malls, hotels, airports, hospitals, and theatres where a person is always required to open the door manually for visitors. For people in wheelchairs (physically disabled persons), it is very difficult to open the door. In warehouses and other places where people mostly have their hands full on contributing to the safety and efficiency by making it simple for people to get around. Current systems to open and close the door, the traditional way is to manually open and close the door. Using the mini-computer, 'Raspberry-pi', the smart doorbell, hence solves the problem of opening and closing of the door automatically. This smart doorbell alerts you, when the bell is rung and permits you to see the visitors from your current location, anytime and anywhere. With the most important feature like you will be able to see a live image of the visitor on your mobile device through the internet. The system also has a face recognition component to differentiate known and unknown visitors.

A. Existing System

In existing systems, there is an absence of many features like face recognition and OTP mechanism. In this project, we have overcome those traditional security problems. Very few systems are available that meet today's security goal, but they are very expensive and difficult to use, so we developed this system so anyone who needs security for their houses can use this system.

B. Problem Definition

To develop a smart security system that provides stronger security from unauthorized access and can be controlled and monitored remotely from any geographical location.

C. Purpose

To overcome the vulnerabilities of existing systems and add some extra features that meet today's security goals.

D. Goals and Objectives

The Goals and Objectives of the given system are as follows:

- 1) To provide security when the owner is not present in home.
- 2) To give access to the guest in the absence of the owner.
- 3) To alert the owner of the house about the status of their homes.

E. Features

- 1) Face recognition
- 2) System can differentiate between known and unknown persons.
- 3) Alert system.
- 4) Real-time security.

F. Flowchart of Proposed System

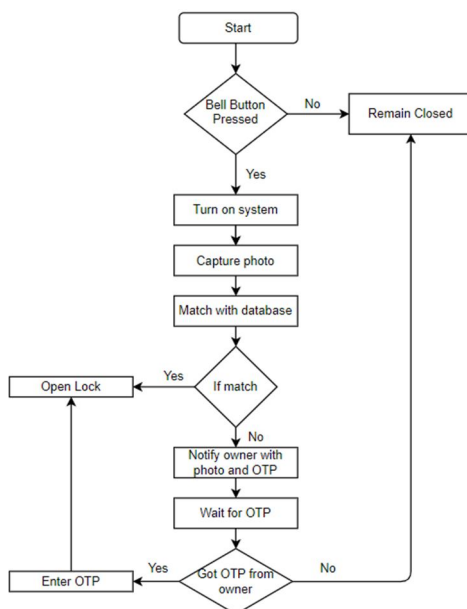


Fig – Flowchart

II. METHODOLOGY

The following figure describes about the systems architecture of this project. It describes about all the components and sub-components on which the system consists of. Here, the system is designed using Camera module, Keypad, Lock mechanism, etc. So this is the description of overall architecture of the system where all the platforms are inter linked to perform a particular task. When guests hits the bell button on the door then the camera located in front of the door immediately get invoked. The camera captures the photo of guest and analyze it to determine whether the guest is known or unknown. If the guests are known then simply the door will opens and guest will have the access of house. But if the system determines that the guest are not known that is Unknown then one alert will goes to owner of the house containing photo of guest and one system generated OTP. Depending on the willness of house owner he/she can give access to guests by giving OTP, now guest has to enter the OTP received from owner and they will have access of house.

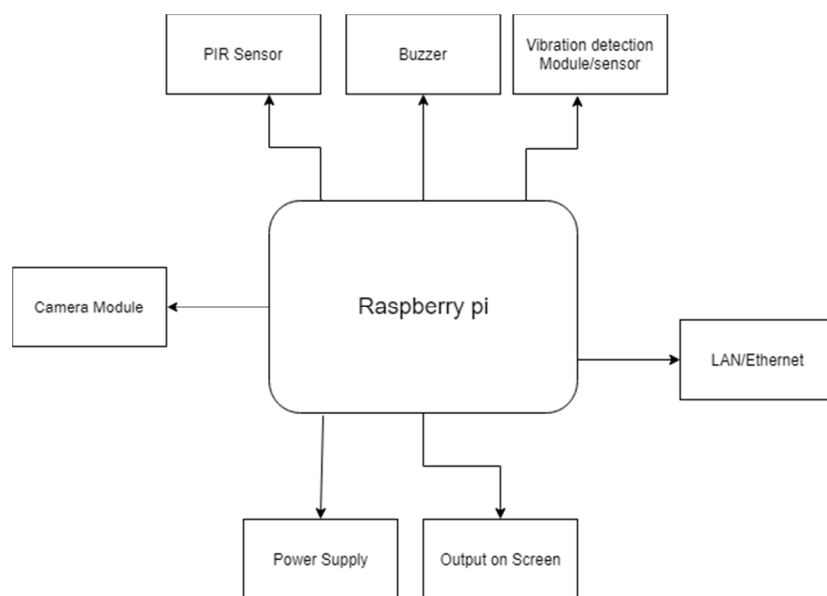


Fig – Block diagram

III. SYSTEM REQUIREMENTS

A. Software Required

- 1) Programming language – Python
- 2) Libraries – OpenCV, Tkinter

B. Area of Project

Internet of things , security, face recognition.

C. Hardware Required

- 1) Raspberry-Pi
- 2) Camera
- 3) GSM Module
- 4) Buzzer
- 5) Keypad
- 6) Solenoid Lock

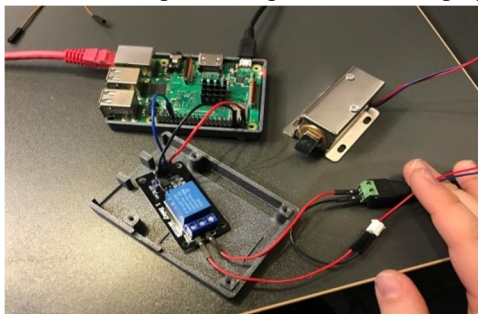
D. Limitations

- 1) If proper distance not maintained in front of camera then system cant recognize person.
- 2) If proper light not present then camera not able to detect person.
- 3) If one of the component not working correctly then system tends to failure.

IV. RESULT

Our implemented system works correctly as per requirement and we have tested it for all the situations that has chances to occur in real life. It is able to differentiates known and unknown person and take actions accordingly.

The following figure shows the system implementation as per the requirement of his project.



V. CONCLUSION

The proposed system can be replacement to the traditional lock system as it has many feature like face recognition, OTP based verification to provide best security experience to the house owner. This system makes efficient use of all the hardware modules to improve overall performance of the system.it is able to work in any condition to provide best security experience. It gives maximum security from unauthorized access with maximum accuracy.

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