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Smart Bell Using IOT

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Abstract*: Internet of things is the communication of anything with any other things. This paper aims to monitor and control the home lock using the internet of things. Moreover the internet of things is used remotely to view the activity and get notification when there is a presence of nearby object without any physical contact and whenever a door bell is pressed and raspberry pi camera module get triggered and capture the photos. The photos are sent to an email through Wi-Fi, and through the webserver he can control the door lock /unlock. The raspberry pi stores the data of authorized person. If the PIR sensor senses the person who is authorized then it automatically unlock the door. Therefore advantage like these make this application ideal for monitoring homes in absence.

Keywords—Smart bell, IoT, Raspberry pi 3, PIR sensor, Raspberry pi camera module.

I. INTRODUCTION

The Internet of Things (IoT) is an important topic in technology industry, policy, and engineering circles and has become headline news in both the specialty press and the popular media. This technology is embodied in a wide spectrum of networked products, systems, and sensors, which take advantage of advancements in computing power, electronics miniaturization, and network interconnections to offer new capabilities not previously possible. An abundance of conferences, reports, and news articles discuss and debate the prospective impact of the "IoT revolution"—from new market opportunities and business models to concerns about scurity, privacy, and technical interoperability.

The project idea is to design an automated device for locking and unlocking of the door as nowadays an automated device can replace good amount of human working force, moreover humans are more prone to errors and in intensive conditions the probability of error increases whereas, an automated device can work with diligence, versatility and with almost zero error. . The system is designed such that the motion of the user will be captured from the camera and the user will be detected and then only he will lock or unlock the door.

The system will be designed for security purposes. It will work as when bell rings at the door, and also when the motion of human is detected in range by PIR sensor it will act as a trigger to the camera and the camera will capture the image of the person standing in front of the door, that will be shown to the registered user who is away from home and then he will identify the person if he need that person to enter the home he can unlock the door or else it remain lock. This increases great security for homes and that too without human intervention.

II. RELATED WORK

Aamir nizam Ansari et aL., [1] this paper aims to describe a security alarm system using low power chip using IoT which helps to monitor and get alarm when motion is detected and send photos and videos to a cloud server. Moreover, internet of things based application can be used remotely to view the activity and get notification when motion is detected. The photos and videos are sent directly to a cloud server, when the cloud is not available then the data is stored locally on the raspberry pi and sent when the connection resume.

Bhalekar Pandurang et aL., [2] this paper aims to design for security purposes. It will work as when bell rings at the door, it will act as a trigger to the camera and the camera will capture the video of the person standing in front of the door, that will be shown to the registered user who is away from home and then he will identify the person and can share the key with that person for a particular time period. This increases great security for homes and that too without human intervention. The system is designed such that the motion of the user will be captured from the camera and the user will be detected and then only he will be given a key to lock or unlock. Our smart lock system will operate over wireless network like Bluetooth.

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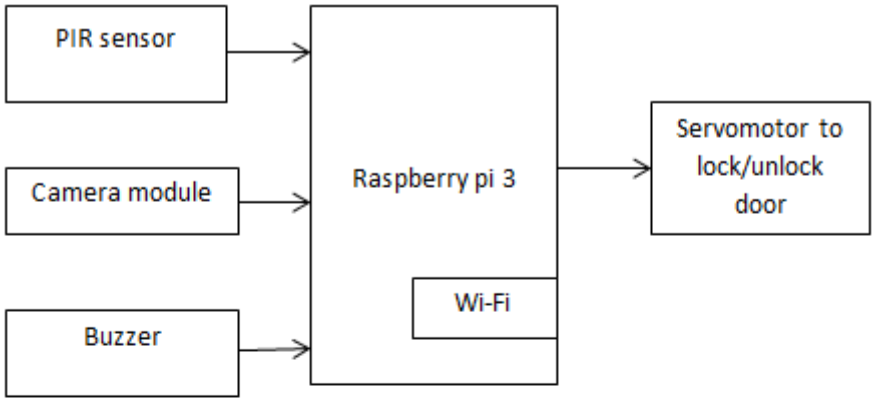
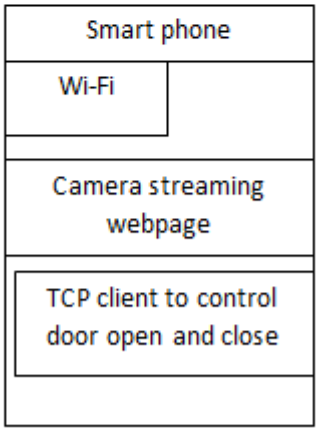
III. PROPOSED DESIGN METHODOLOGY:



Host side



Recipient side

Smart home security control system has become indispensable in daily life. The design and development of a home security system, based on human face recognition technology and remotely monitoring technology, to confirm visitor identity and to control door accessibility has been reported in this paper. This paper describes about the implementation and deployment of wireless control system and accessibility in to a home environment for authenticated people only. When the buzzer is pressed by the person and if The PIR sensor able to detect the presence of nearby object without any physical contact, the camera is activated, and captures the image of the person standing near the door or in the range of PIR sensor. Here the raspberry pi model is connected to spy camera to capture the image. When image of the person is authorized in the raspberry pi then the servomotor automatically unlock the door. When image of the person is not authorized in raspberry pi then through Wi-Fi an image of that person is sent to an email. The owner get the notification, if he want to unlock the door through the mobile app he can unlock the door.

A. Component required

1) *Raspberry pi 3:* The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science. The original model became far more popular than anticipated. Peripherals (including keyboards, mice and cases) are not included with the Raspberry Pi. Some accessories however have been included in several official and unofficial bundles. The Raspberry Pi hardware has evolved through several versions that feature variations in memory capacity and peripheral-device support. Raspberry Pi is also an ideal rapid

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prototyping platform for professional engineers and is also being integrated into more and more commercial and Industrial application.

2) *PIR Sensor:* The electronic sensor used to detect the movement of human being within a certain range of the sensor is called as PIR sensor or passive infrared sensor (approximately have an average value of 10m, but 5m to 12m is the actual detection range of the sensor). Fundamentally, pyro electric sensors that detect the levels of infrared radiation are used to make PIR sensors. The PIR sensor circuit is used in numerous electronics projects which are used to discover a human being entering or leaving the particular area or room. These passive infrared sensors are flat control, consists of a wide range of lens, and PIR sensors can be easily interfaced with electronics circuits.

3) *Camera module:* A few weeks ago, the Raspberry Pi Foundation launched their first peripheral, a 5MP camera. Priced at $25, the same price as the model A, it's a very small PCB on which is an Omnivision OV5647 camera module. I t connects to either the Model A or Model B Raspberry Pi using a 15cm 15 way ribbon connector. There are only two connections to make, the ribbon cable needs to be attached to the camera PCB and the Raspberry Pi itself. High definition camera module compatible with the Raspberry Pi model A and model B. Provides high sensitivity, low crosstalk and low noise image capture in an ultra-small and lightweight design. The camera module connects to the Raspberry Pi board via the CSI connector designed specifically for interfacing to cameras. The CSI bus is capable of extremely high data rates, and it exclusively carries pixel data to the BCM2835 processor.

4) *Piezo buzzer:* A piezoelectric buzzer is a loudspeaker that uses the piezoelectric effect for generating sound. A Piezo buzzer has a Piezo disc and an oscillator inside. When the buzzer is powered, the oscillator generates a frequency around 2-4 kHz and the Piezo element vibrates accordingly to produce the sound. An ordinary Piezo buzzer works between 3 – 12 volts DC

5) *Servomotor:* A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

A servomotor is a closed loop servomechanism that uses position feedback to control its motion and final position. The input to its motion is a signal (either analogue or digital) representing the position commanded for the output shaft.

A servomotor operates on a system based on sending three different pulse widths to the unit to produce movement that range from 0 to 90 to 180 degree. A 1ms pulse width will position the motor to the extreme left (0 degree) a 2ms pulse width will position the motor to the extreme right (180 degree) and a 1.5ms pulse width will position the motor in between these two extremes (90 degree).This operation can be used to actuate a door lock or a latch to enable you to remotely lock and unlock a door or gate.

IV. RESULT

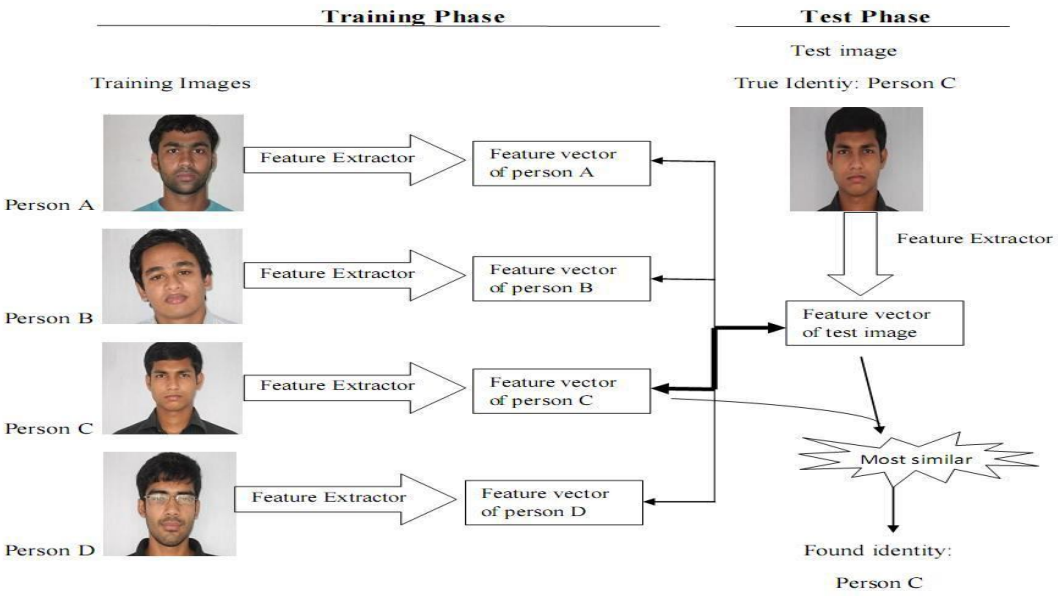

Fig 1: Schematic diagram of a face recognizer

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V. CONCLUSIONS

This paper gives basic idea of how to remotely monitor and control door. It will work as and when bell rings at the door or any motion is sensed at the door, it will act as a trigger to the camera and the camera will capture the image of the person standing in front of the door, that will be shown to the registered user who is away from home and then he will identify the person and through the web server he can control the door lock.

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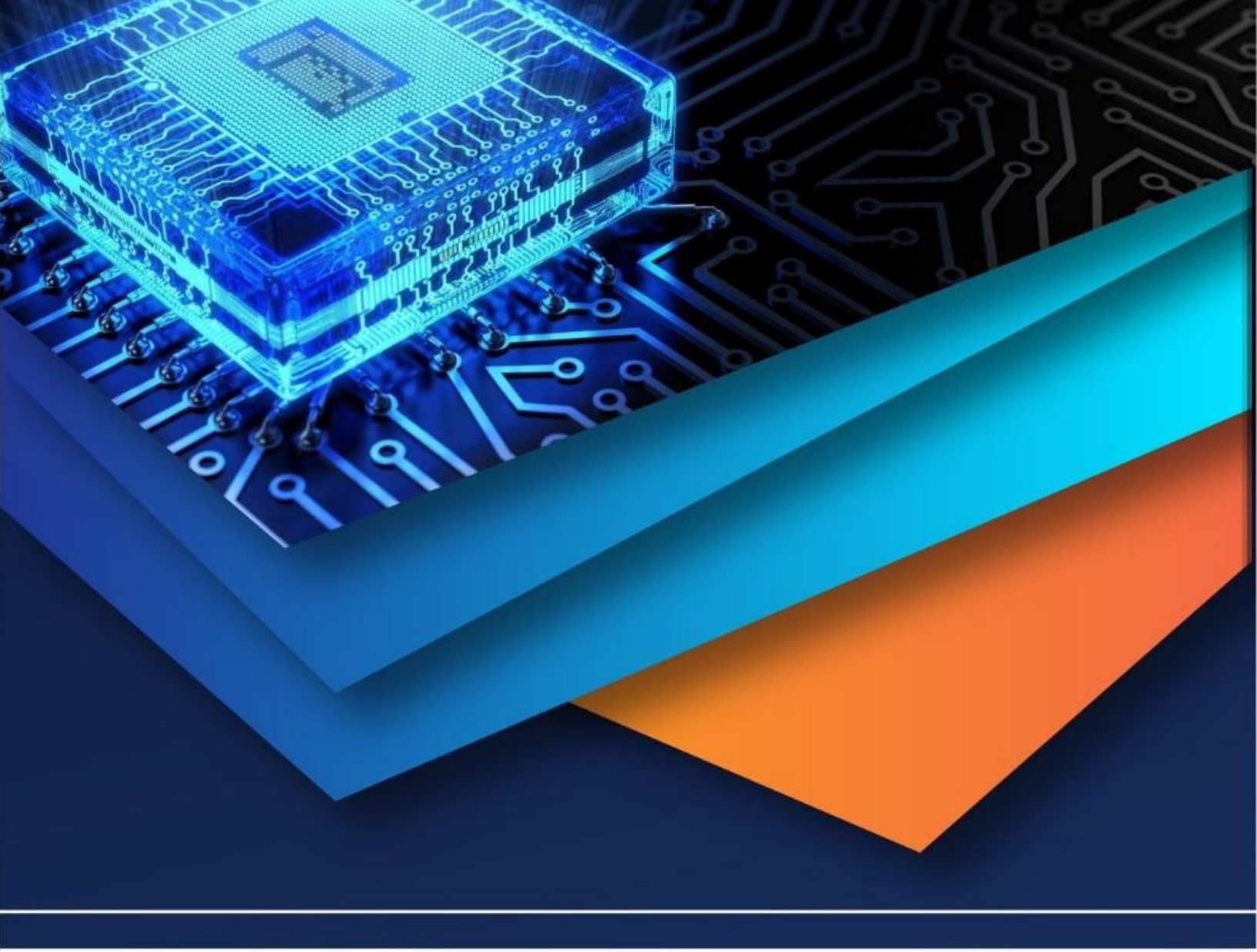

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