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Home Security System Using Raspberry Pi with Sound and Email Notifications

Mrs.Shasri Vishwasrhree[1]., Akubathini Chandana[2]

1 Assistant Professor, Department of ECE Malla Reddy College of Engineering for Women., Maisammaguda., Medchal., TS, India

2, B.Tech ECE (20RG1A0403),

Malla Reddy College of Engineering for Women., Maisammaguda., Medchal., TS, India

ABSTRACT

In addition to alerting the owner via email, this paper also serves to secure the house. This approach has the potential to quickly identify the existence of an unknown user on a Raspberry Pi. In this configuration, a Raspberry Pi camera is used to take a picture of the unknown person and then attach it to the email. Anywhere where safety is of the utmost importance, such as our homes, offices, or any other location, may benefit from this method.

Keywords: - Smartphone, Webcam, Data, Bluetooth, Short Message Service, Web Method, Electrical Circuit.

I.INTRODUCTION

Providing an effective defence for the home is the primary goal of design. You may use this method to keep an eye on the system at all times, no matter where you are. This plan offers a low-cost, wireless way to protect the home from intruders while the owner isn't there and to manage all of the appliances from any location. For security and appliance control, the design incorporates state-of-the-art wireless communication technologies such as Bluetooth, infrared, and Wi-Fi. The rise in criminal activity has made home security a pressing concern. Taking the necessary precautions to avoid invasion is the primary concern of everyone. The system's operation is both easy and efficient. The Raspberry Pi camera takes pictures whenever it senses a person other than the owner is around, and the PIR sensor notifies the owner of this. The mysterious individual is detected as soon as they approach the PIR sensor. Initiating the Pi camera causes it to snap pictures, which it subsequently stores. Using Pi, we can make a default email and attach this photo before sending it to the owner. Name, time, and date are appended to the photos taken by the Pi camera. The PIR potentiometer allows the user to change the design's detecting range.

2.Existing System

As it is, current security measures like closed-circuit television (CCTV) and fingerprint detectors aren't very good, and they're also costly and power hungry. With the suggested setup, you won't have to worry about problems like SIM card corruption or network issues caused by the GSM Module with Linux.

3.Proposed system

To reduce power consumption, provide a versatile safeguard device for detecting unknown persons and door safeguards, and aid in preventing theft in highly secure locations like authorised investment centres, automated teller machines, and houses, the proposed Raspberry PI house safeguard system is a great idea. Using a combination of a PIR and a magnetic sensor, this suggested solution efficiently handles cost-sensitive security concerns. Instantaneously upon detecting a person, this sensor captures their image with the Raspberry Pi camera and notifies them by text message or email. Python 3 coding programming is used to verify the system.

4.. METHODOLOGY

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The solution of the problem is dividing the work into 3 modules. Modules -: Module 1- Near field communication (NFC) based safeguard

In this module the detection range of PIR sensor will be tested as well as the Raspberry PI Camera and we will use Python language to save the images.

Module 2- Android based control

In this module we will develop an android based app to create convenience for the user to access thesystem.

Module 3- Way to SMS notification

We will send the SMS notification and the mail alert. Develop software for mobile device which integrates all 1. Capturing of images 2. Sound Recording 3. Wireless Communications devices 4. Email 5. SMS and to identify such electronic devices which uses for House safety to communicate with our programs.

4.1. BLOCK DIAGRAM

Fig:1 Block diagram

Hardware Requirement

- Raspberry pi
- USB camera
- PIR sensor
- Buzzer

Software Requirement

- Python

4.2 Working

- The „PIR" sensor detects an unknown person, activates the camera, capture the picture of unknown person.
- The capture picture sends to owner through e-mail.
- The Buzzer goes on.

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5. HARDWARE COMPONENTS

5.1 Raspberry Pi

A Raspberry Pi series of small single-board computers developed in the United Kingdom by Raspberry Pi Foundation in association with Broadcom. A raspberry pi is a fully functional tiny computer in available in low-cost. It is also known as single board computer, but it is nothing less than a computer. It is basically used for teaching basic computer science in school level. The Raspberry Pi has it's uses in many areas like weather forecasting, Robotics and in several automations. It is available at a very low cost and it's adaptive nature is very helpful in designing many circuits

Fig: 2 raspberry pi

5.2 PIR sensor

It detects the human presence other than owner and the Raspberry Pi camera captures the images and sends them to the user. This PIR sensor detects the unknown person when they come in range of it. The Pi camera will be triggered and this camera captures the images and then saves it.

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```
from picamera import PiCamera

from time import sleep

import smtplib

import time

from datetime import datetime

from email.mime.image import MIMEImage

from email. mime. Multipart import MIMEMultipart

import RPi.GPIO as GPIO

import time



toaddr = 'TO_EMAIL'

me = 'FROM_EMAIL'

Subject='security alert'



GPIO.setmode(GPIO.BCM)



P=PiCamera()

P.resolution= (1024,768)

P.start_preview()
```

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6. design

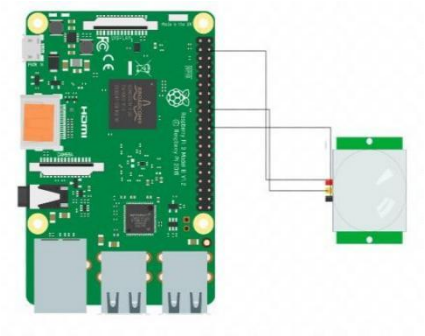

Fig:6 Raspberry pi with PIR sensor.

PIR sensor connection with Raspberry Pi is show in above Schematic diagram.

Fig:6 Raspberry pi with USB camera.

USB camera connection with Raspberry Pi is show in above Schematic diagram.

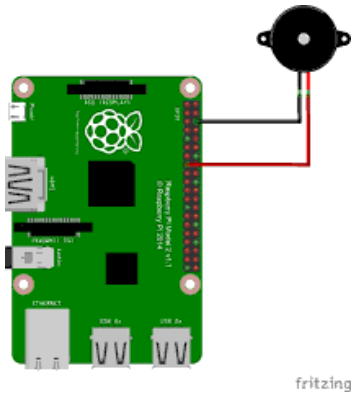

Fig:6 Raspberry pi with Buzzer.

Buzzer connection with Raspberry Pi is show in above Schematic diagram.

6 RESULT

When it comes to security, this system is compatible with all the current mobiles and other wireless communications. Features of the system include the ability to remotely operate appliances, the ability to detect intrusions, a safeguard for the system, and auto-configuration, which involves the system automatically adjusting its settings when a hardware support check is done. This

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project will provide the following outcomes. Initially, the user will be prompted to provide login and authorization details via email once their likeness is captured and saved in a database.By acting swiftly, we can ensure everyone's safety, including the children. If parents are going to be out of town, they will be notified.
The residence is monitored from a distance. If somebody attempts to enter the home without permission, you will get a notification via SMS or email. Direct user access to recorded pictures is possible.

V.CONCLUSION

We have created and constructed a house protection system that uses a Raspberry Pi, PI camera, and PIR sensor. Through e-mail, the user may get alerts at any time and from any location. It will sound an alert if it detects any movement that is either unknown or suspicious. Therefore, no unauthorised individuals will be able to enter the house thanks to the created system.

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