RASPBERRY PI BASED HOME SURVEILLANCE SYSTEM USING SMTP

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1. Abstract:

The goal of this paper is to design and implement a home security system by integrating smart phone and home network service in the absence of residents. With visitor pressing the doorbell, the device records and sends the CCTV of the visitor to the user. Our system provides a convenient user interface for the user to know the surrounding and take appropriate action accordingly. This is implemented by interlocking with the real time SMS server that sends warning message to user when the doorbell is pressed. Raspberry pi supports video and saving images, text and GUI features. Our smart bell system presented in this paper supports video, saving images, warning notice, other features. So using open cv we are detecting the face of the person and sending warning message if necessary using IOT.

Keywords:- IOT, GUI, SMS

2. INTRODUCTION

The goal of this paper is to design and implement a security system by integrating smart phone and home network service. When the visitor presses the doorbell, the device captures an image through the
camera and sends that image of the visitor to the user. Our system provides a convenient user interface for the user to view the image and can take appropriate action immediately. This is implemented by interlocking with the real time SMS server that send an alert message to the owner when the doorbell is pressed. The Internet of Things (IoT) is the system of physical articles, gadgets, vehicles, structures and different things which are installed with hardware, programming, sensors, and system availability, which empowers these items to gather and trade data. The Internet of Things (IoT) enables items to be detected and controlled remotely crosswise over existing system framework, making open doors for more straightforward incorporation between the physical world and PC based frameworks, and bringing about enhanced effectiveness, exactness and financial advantage; when IoT is enlarged with sensors and actuators, the innovation turns into an example of the more broad class of digital physical frameworks, which additionally envelops advancements, for example, brilliant networks, shrewd homes, insightful transportation and keen urban areas. Everything is exceptionally identifiable through its inserted processing framework yet can interoperate inside the current Internet foundation. Specialists appraise that the IoT will comprise of right around 50 billion protests by 2020. Microcontrollers as the name proposes are little controllers. They resemble single chip PCs that are regularly installed into different frameworks to work as preparing/controlling unit. For instance, the remote control is utilizing most likely has microcontrollers inside that do interpreting and other controlling capacities. Cloud computing is a data innovation (IT) worldview that empowers pervasive access to shared pools of configurable framework assets and larger amount benefits that can be quickly provisioned with negligible administration exertion, frequently finished the Internet. Distributed computing depends on sharing of assets to accomplish cognizance and economies of scale, like an open utility.

2.1. EXISTING SYSTEM

An existing system there is only RF based security system, main drawback in this system, whoever having that RF card it In allows that person, it doesn’t look for any facial recognition.
2.2. PROPOSED SYSTEM

In this proposed system, we are having database of authorized person list by registering their faces by entering OTP, so that non-authorized person can’t able to enter the home until they entering the OTP. Whenever some person pressing calling bell switch, camera gets triggered and capture the image of the intruder and checks that image with the database, if that face is not matching with the database, it sends an email containing that intruder image and OTP, when intruder type the OTP by the owner’s knowledge then it allows to enter.

3. BLOCK DIAGRAM

If a visitor presses the doorbell installed at the door of your house, this system takes a picture of the visitor and sends the image to the owner, and it also sends an alert message to the owner that someone is waiting for you at the door. This execution is outlined with Raspberry pi. In these distinctive modules, for example, Raspberry pi. It is executed by utilizing two modules Base station module and In-Bus module.
4.HARDWARE MODULES

4.1. Raspberry-pi

The Raspberry Pi 3 Model B is the third generation Raspberry Pi. This powerful credit-card sized single board computer can be used for many applications and supersedes the original Raspberry Pi Model B+ and Raspberry Pi 2 Model B. Whilst maintaining the popular board format the Raspberry Pi 3 Model B brings you a more powerful processor, 10x faster than the first generation Raspberry Pi. Additionally it adds wireless LAN & Bluetooth connectivity making it the ideal solution for powerful connected designs.

4.2. DC MOTOR

DC engines are arranged in numerous sorts and sizes, including brush less, servo, and apparatus engine composes. An engine comprises of a rotor and a changeless attractive field stator. The attractive field is kept up utilizing either changeless magnets or electromagnetic windings. DC engines are most regularly utilized in factor speed and torque. Movement and controls cover an extensive variety of parts that somehow are utilized to produce as well as control movement. Regions inside this class incorporate direction and bushings, grips and brakes, controls and drives, drive parts, encoders and resolves, Integrated movement control, restrict switches, straight actuators, straight and rotating movement segments, straight position detecting, motors(both AC and DC
engines), introduction position detecting, pneumatics and pneumatic segments, situating stages, slides and aides, control transmission (mechanical), seals, slip rings, solenoids, springs.

4.3. BUZZER

![Buzzer Image]

**Fig 4.3:- Buzzer**

A bell or beeper is a sound flagging gadget, which might be mechanical, electromechanical, or electronic. Normal employments of ringers and beepers incorporate cautions, clocks and affirmation of client information, for example, a mouse snap or keystroke.

5. SOFTWARE TOOLS

5.1. Linux

Linux is a free open source working framework and it has a place with the Unix working frameworks. In reality Linux implies the piece itself which is the core of the working framework and handles the correspondence between the client and equipment. Regularly Linux is utilized to allude to the entire Linux dispersion.

Linux appropriation is a gathering of programming in view of the Linux Kernel. It comprises of the GNU-task's parts and applications. Since Linux is an open source venture, anybody can alter and circulate it.

5.2 Raspbian Wheezy

Raspbian Wheezy is a free working framework in view of Debian appropriation. It is made by a little group of designers who are enthusiasts of Raspberry Pi. Raspbian is improved for the Raspberry Pi's equipment and it accompanies more than 35 000 packages and pre-incorporated programming. Raspbian is still under dynamic advancement and it intends to enhance the solidness and execution of the Debian bundles.
5.3. Python

Python is a multi-worldview programming dialect: protest arranged programming and organized writing computer programs are completely upheld, and there are various dialect highlights which bolster practical programming and viewpoint situated programming (counting by meta programming and by enchantment strategies). Numerous different standards are bolstered utilizing expansions, including configuration by contract and rationale programming.

5.4. Open-cv

OpenCV-Python is the Python API of OpenCV. It joins the best characteristics of OpenCV C++ API and Python dialect. OpenCV Python is a universally useful programming dialect begun by Guido van Rossum, which turned out to be extremely mainstream in brief time fundamentally due to its effortlessness and code lucidness. It empowers the software engineer to express his thoughts in less lines of code without decreasing any clarity. Contrasted with different dialects like C/C++, Python is slower. In any case, another vital component of Python is that it tends to be effectively reached out with C/C++. This component causes us to compose computationally concentrated codes in C/C++ and make a Python wrapper for it so we can utilize these wrappers as Python modules. This gives us two favourable circumstances: first, our code is as quick as unique C/C++ code (since it is the real C++ code working in foundation) and second, it is anything but difficult to code in Python. This is the manner by which OpenCV-Python works, it is a Python wrapper around unique C++ execution. Furthermore, the help of Numpy makes the errand more less demanding. Numpy is an exceedingly upgraded library for numerical tasks.
6. RESULT

- Above figure shows the output in the monitoring screen after training i.e. when the person is detected it will compare with the database.
- As the above image displays that the person is unauthorized it will send the mail to the person image using SMTP.

Fig 6.1 capturing the image

- The database. Above figure shows the output on the monitoring screen, when the person come in front of the camera it will automatically detect the person.
- Captures the image and start comparing with

Fig 6.2 Unauthorized person

Fig 6.3 Authorized person

If the person is authenticated it will display the person name and also the status i.e. the person is authenticated or not as shown in the image.
7. CONCLUSION

The whole project takes a new look at the traditional bell vs the modern technology using IoT. With the use of Raspberry Pi, Camera, sensors and other various important modules, our homes are certainly more monitored and secured. This technology will definitely improve the security of our houses. We proposed a system of real time smart door to provide communication between clients and home security. In order to provide effective system, we used Raspberry Pi embedded system which is integrated on the door of a house. The system is based on video technology which is a very popular technology for providing security and safety in urban areas. We used Raspberry Pi because it is a strong and reliable embedded system device for solving complex and challenging tasks. Using both technologies in the system provide various benefits to increase the efficiency in terms of communication between visitor and owner of the house and providing safety of home, thus making use of IoT and integrating it into our day to day lives.

8. REFERENCES


[5] Preeti Godabole, Akhil Menon, Prashant Singh, Pramit Yadav, “Communication over Internet and GSM using Smart Doorbell” in