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Smart Facial Unlock for Home Security using IoT

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Abstract:- This project is motivated by the security for our homes in this fast changing technological world. With the help of new technologies like Internet of things everything is becoming smart and more users friendly. In this project, we are trying to improve the security of our modern homes by making security systems smarter by using internet of things.

I. INTRODUCTION

A. Devices Required

Raspberry-pi, high quality web camera, buzzer alarm

B. Existing System

Existing system just uses cctv camera. The surveillance by cctv camera is manual and it requires lots of storage. In some of the modern systems, there is camera which is installed both inside and outside of homes so that you can clearly see the person who wants to enter in your house.

C. Disadvantage of existing system

Existing system requires lots of power and storage. Since they are not installed with any smart technologies, the data from them can be easily deleted or manipulated. Such systems only protect your home when you are present.

II. PROPOSED SYSTEM

The system is composed of a Raspberry- pi , high quality web cam, a buzzer alarm. All the components are connected and interfaced with the raspberry- pi. The high quality web camera is installed outside the house and it is continuously monitoring the door and other areas. Faces of all the family members and other acquaintances are already stored in the system. using image processing through open cv it monitors the faces in front of the doors. If all the faces matches with the systems it does not trigger any alarm. Suppose some intruder tries to enter your house, the face will not match with already stored images and it triggers an alarm.

Moreover all this information will be send to cloud and the owner will get an e-mail about this suspicious activity. Since all this data is already stored in the cloud, it can be used by police

and other authorities for reference.

III. ADVANTAGES OF PROPOSED MODEL

Proposed model not only protects your home when you are inside but it also guards it when you are not around. It uses IoT to smartly guard your home. Moreover it requires less power and space. It very economical and user friendly. The biggest advantage is, it's all under your control.

IV. MODULES

A. Image capturing
B. Image processing
C. Recording data
D. Sending data to cloud

Block Diagram

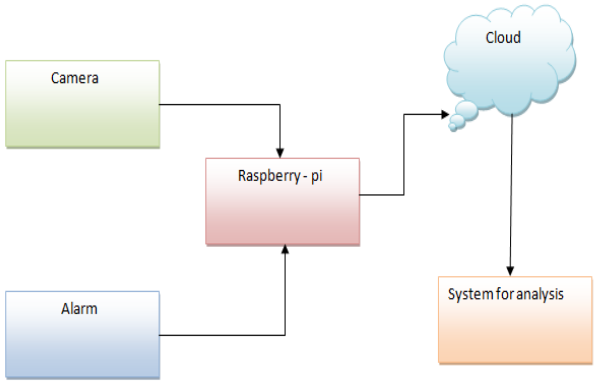

Fig 1:- Block diagram for smart face unlock for homes using IoT

A. Capturing image

The image of the person is captured by the web camera which is further used by the Raspberry system for image processing using open cv.

B. Image processing

The image captured by the camera is further used for processing. In image processing, similarity of image is checked by SSIM (structural similarity index). A threshold is set for the matching of images. The images are correctly matched if SSIM value for two images is less than the threshold.

C. Recording Data

If the image is not matched, the unmatched image will be stored in the system for future reference. Also a mail will be sent to users account about any of such activity.

D. Sending data to the cloud

For this model, we have used think speak as a cloud. If any suspicious occurs, date and time is recorded which can be seen by owner at any time and from anywhere in the world.

➢ *Source Code*

For coding, we have used python as a primary language

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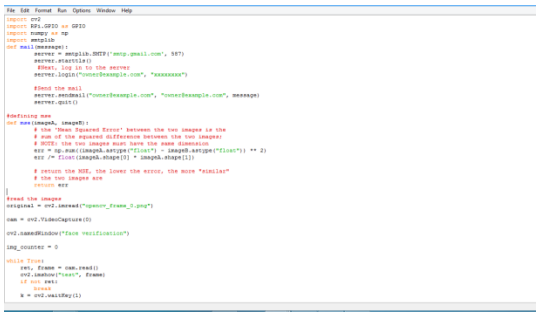

Fig 2 :- code for the proposed model

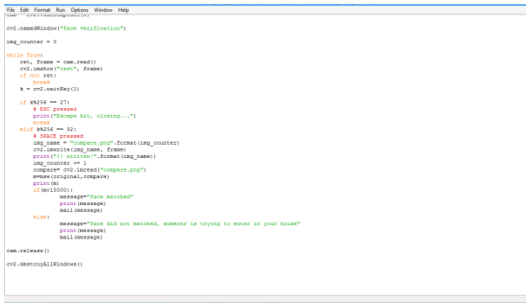

Fig 2.1:- Code for proposed model

V. CONCLUSION

From this project we conclude that the security of our modern homes can be made smarter by using new technologies like IOT and we can protect and guard our homes in a smarter way.

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