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Face Recognition by Smart Surveillance and Tracking System

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Abstract: *A smart home security control system has become very important in everyday life. Design and development of a home security system, based on human face recognition and remote monitoring technologies, verification of guest ownership and control of departmental access are reported in this paper. This paper describes the use and distribution of a wireless control system and home access only to authorized people. Automatic face recognition handles security issues with flexibility in case of anonymity or a stranger, real-time video streaming is processed, motion detection, and dual-axis pan-tilt servos track that person with a camera. In addition, such bizarre activity is recorded on video in sync from cloud storage, and mobile alerts are generated. When the Internet is not available, a website file is upgraded with an audio notification being sent to the security room if an anonymous face is not present on the website. Speech recognition and voice transmission are also added to transmit voice and activate the surrounding lights. This project aims to replace expensive security systems using Raspberry pi 3B + as a laptop.*

Keywords: Face recognition

I. INTRODUCTION

Safety and surveillance have a profound impact on many areas of life. Due to the rising crime rate and suspicious activity, security measures are highly recommended everywhere. Protective devices are widely used for cameras, infrared sensors, RFID readers, and Retina sensors. These are all ineffective and sometimes expensive ways to get started. These methods provide continuous monitoring, leading to high energy expenditure and memory impairment. Most of the time, it is cheap, but this technology does not offer portable solutions. One can memorize and remember many faces quickly. Face recognition is used for the most important types of biometry. These rules help us to see the face quickly with the notification of that person's name in the email and cell phone of the manager. It will also issue a warning if there is an unknown or suspicious person. This face detection system is an excellent tool for preventing terrorist activities. This process is useful for detecting unusual behaviour or suspicious activity. The camera starts to see a person in real-time streaming instantly.

II. PROBLEM STATEMENTS

The concept of facial recognition is to give the computer system the ability to detect and detect a person's face quickly and accurately.in photos or videos. Many algorithms and techniques have been developed to improve the performance of facial recognition. Recently Deep reading has been extensively explored in computer visual aids. The human brain can detect and detect multiple faces automatically and instantly. But when it comes to computers, it is extremely difficult to perform all the challenging tasks at the human brain level. Face recognition is an important part of biometrics. In biometrics, human features are compared to existing data. Facial features are also removed using algorithms, which work well and some modifications are made to improve the existing algorithm models. Computers detecting and seeing faces can be used in a variety of applications including crime detection, security systems, identity verification etc.

III. LITERATURE SURVEY

The purpose of the literature audit is to identify relevant information for the project work and its potential and well-known impacts within the project area. This section must include a complete report of current market research conducted on the problem. Include a study of the similar systems available, if any and their advantages and disadvantages. identify those areas

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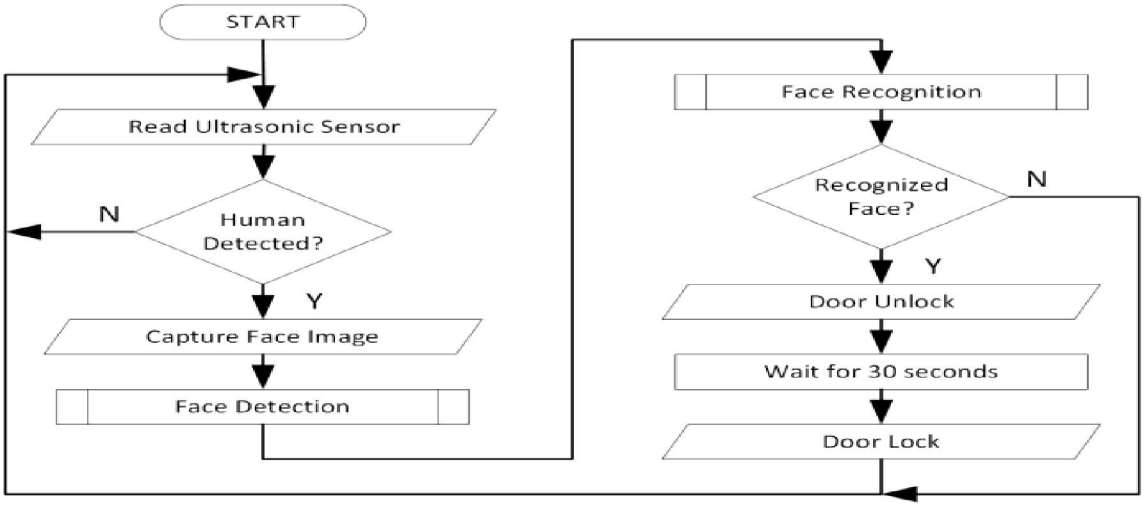
where there is no shortage or shortage. The proposed approach is portable, economical, and robust due to the addition of smart functions. The proposed system is a built-in wireless access control system and designed for a smart home environment. Cloud-based video storage system adds security purpose The program detects a visitor's presence, captures and transmits image and alert via automatic buzzer to the homeowner to see guests. It has various features such as energy saving, intelligence, low cost, portability and high performance. By using this method, we can see faces during the day and night and we can also see faces facing 15 degrees. By using a webcam this process can work more than 200cm. Face detection and detection are the two main components of facial recognition. The feature extract is done in the form of LDA (Linear Discriminant Analysis) system gives an accuracy rate up to 82.

Sr. No	Research Paper Title and Publication Details	Authors	Methodology	Results/Conclusion & Discussion
1.	Face Recognition Door Lock System	Prof. Md Tauseef	The system will work in two different parts. The first part is for capturing and creating a database by storing the image. And the second one is to compare the image with the stored images in the database.	A Secured Door Lock System Based on Face Recognition using Raspberry Pi and GSM module is presented. We designed the system which provides security locks for door, comfort, connivance security and energy efficiency for user.
2.	Face Recognition: A Literature Review	Nawaf Hazim Barnouti	Model-based face recognition methods aims to construct a model of the human face that capture facial variations. Prior knowledge of the human face is highly utilized to design the model.	we have implemented a face recognition door lock system. Recognizing of faces is done by using cascade classifiers, which gets a high accuracy and will store in the database.

IV. DESIGN CONCEPT

Often, people used to lock the doors to protect themselves from thieves or other people. There are various home access control systems such as a key, barcode ID, or other system that any unauthorized person can access. But within the face recognition system, facial data is stored in a Raspberry pi-based operating system and will compare real-time with people who come before the webcam. The Raspberry Pi3 has been used because it is a credit card-sized computer that can run faster than other large size computers and therefore the project will take up less space but work more efficiently. Another reason to use the Raspberry Pi3, its GPIO pins and to use other pins to control Door strikes



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- Connect the power adapter to the Raspberry pi, Install and Open VNC viewer on a portable computer. To unlock it we must provide the Raspberry pi IP Address.
- An open CV is used to process an image. Open the CV algorithm shown above in Figure 2. First, we build a website (or we have to train the project by providing images at different angles). When the camera turns on, it reads the picture again after discovery. It will cut and save the face like gray from the picture. He then sees a face with their names, which we kept during training. And then again reads the following picture. This process repeats itself over and over again.
- Install the pushover app on our android phone for notification
- We have created 4 Face Database programs, Face Detection, Face Detection and Face Trainer using Python Language.
- Power given for the first time to raspberry pi. And the power adapter enables the relay to work.
- Open VNC viewer to capture a person's face.
- After that the Raspberry pi sends a signal to the transmission, it burns the solenoid valve to open the door when the face is detected. Here a magnetic switch is used to feel the door open or close.
- If a known face is present then a face is detected. And the door will open automatically and It then sends a pushover notification to our android phone where a known person is found.
- And no action is taken when an unknown face is found. And the only notice that came to our android phone was that a stranger was trying to open the door.

V. System Requirements (Hardware And Software Requirements)

5.1 Raspberry PI 3

Raspberry Pi is a very cheap computer running Linux, windows but also offers a set of GPIO pins (common input / output), which allows you to control the electronic components of a portable computer and explore the Internet of Things (IoT). The Raspberry Pi 3 Model B is the latest computer version of Raspberry Pi for $ 35. The Pi is not the same as your standard machine, in that it is cheaper to charge, and is simply an electronic board the size of a credit card of the type you can find inside a PC or laptop but much smaller. Amazing number. We can use Pi 3 as a budget desktop, media centre, retro game console, or first track. Yet that is just the tip of the iceberg. There are hundreds of projects out there, where people use Pi to build tablets, laptops, phones, robots, smart glasses, take pictures on the edge of space, do experiments at the International Space Station - and that without saying a word wackier creations

5.2 PI- Camera

All Raspberry Pi cameras can take high resolution photos, as well as full HD 1080p video, and can be fully customizable systematically managed, Focused lens on board

- 8-megapixel native resolution sensor with 3280 x 2464 capabilities vertical pixel images
- Supports video 1080p30, 720p60 and 640x480p90 • Size 25mm 23mm x 9mm
- It connects to the Raspberry Pi board with a short ribbon (provided)
- Weight slightly higher than 3g
- Camera v2 is based on the latest Raspbian version, App selected by Raspberry Pi

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5.3 PRI Sensor

A sensor is a device that generates output signals the purpose of hearing something tangible. In a general sense, a sensor is a device, module, machine, or subcontractor that detects events or changes in its location and transmits information to other electronic devices, usually a computer processor. Sensors are often used with other electrical objects. Sensors are used in everyday things such as touch-sensitive cash buttons (touch sensors) and lights that dim or light touch the base, and in countless programs that most people are unaware of OpenCV-OpenCV, or Open-Source Computer Vision Library, began with Intel research project. Depending on the minimum number of jobs contains, now, the largest computer library. More than 2500 algorithms are used in OpenCV! It can be used both for commercial and educational purposes. And that is not all. Many LAN interfaces are included in the library. Library has more than 2500 advanced algorithms, including your complete set of both classic and advanced computer vision and machine learning algorithms. These algorithms can be used to see and see faces, to see things, to distinguish people actions on videos, track camera movement, track moving objects, remove 3D object models, generate 3D point clouds in stereo cameras, combine images to produce a high-resolution image for every scene, find the same images on the photo website

VI. Conclusion

Door locks based on face recognition are designed to provide better protection. It is an easy-to-use program. The use of the Eigen face recognition technique makes the system more secure. This application can be used in a number of areas where high security is required where confidential information and resources are stored. For example, research institutes, banks, Forensic Laboratories. This program can be used for home purposes. This function helps to reduce the problems of theft and fraud. When an unauthorized person enters, system alerts to an authorized person via SMS and at the same time the buzzer rings to notify people. This is a cost-effective and reliable door lock system

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