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# Airport Security System Based on Face Detection Technology

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**ABSTRACT** –In the current years, with the call for greater security, computer systems play a big role. due to their accuracy, huge memory banks and highcomputing power, there have been major developments in the field of face reputation. Computers now surpass humans in many reputational responsibilities. One cannot forget the limited number of faces. However, PC has no limitations and therefore can be used in large face databasesthey are needed. This type of face popularity gadget has many capacity programs that include crowd and airport monitoring, non-public security and step forwardhuman computer interaction. Such a machine is ideally equipped to restore security issues and offers flexibility for smart residence management. The goal of this project is to create a complete facial recognition system: clean to build, affordable and efficient. The basic purpose is to be set up as a home traffic alert and provide visitor facts on a dynamic internet site and talk to the software. It can be extrait is used in other areas such as industries, workplaces or even airports to find wanted people. Some of the other biometric techniques are gaining popularityapproach provides one great advantage, which is consumer friendliness.

**KEYWORDS:** Internet of Things (IoT), Machine learning, Face Detection, LBPH Algorithm, Python, Django

## I. INTRODUCTION

The demands on video surveillance systems are increasing rapidly these days. One of the first things people will want to know about their surveillance system is whether they have the ability to connect to it over the internet for remote monitoring. In the past, security systems had to be guarded by a guard who was locked in a room all day watching the monitors to make sure nothing happened. The second option was to go back and view the recording, but it might have been corrupted. Therefore, researchers and scientists have had to come up with ways to overcome this and thus improve security in general. Commercial spaces, universities, hospitals, casinos and warehouses require video capture systems that have the ability to alert and record in addition to live video streaming of intruders. Advances in video surveillance technology have made it possible to monitor your remote security camera from any Internet-enabled computer or smartphone from anywhere in the world. This includes the use of CCTV (DVR) systems and IP cameras.[1] Therefore, the new innovative technology revolves around the affordability of the product in terms of its cost and ease of implementation. A PIR-based computer system meets both criteria in that it is a cheap, efficient computer that can be linked with other modules to realize systems with immense functionality. A lot can be done on it, from engine speed control, automatic lighting, VPN server, security system, etc.

A web camera-based computer system is able to implement a cost-effective security system for various applications. This emerging security-related technology provides a convenient and secure environment for small households. The various goals of the system are to detect an intruder, take an image of the intruder, and compare this image with the images stored in the dataset. If they match, send an alert message to the device owner along with information related to the image, otherwise, just send the image. This enables remote monitoring of the organization from anywhere in the world[2].

## II. PROPOSED METHODOLOGY

### Statement of scope:

- To achieve effective and correct image processing output, we suggest using the LBPH (Local Binary Pattern Histogram) algorithm, which uses HOG (Histogram Of Oriented Gradient) to improve detection performance.
- This report is about achieving image processing algorithm-based security in a cost-effective and energy-efficient manner.

**Purpose:** We also use a camera module in the proposed system, the camera specifications may change according to the user or application. The captured images are compared to the images in the dataset using the Local Binary Pattern Histogram (LBPH) algorithm. [3] The LBPH algorithm is combined with the HOG (Histogram of the Oriented Gradient) algorithm to improve detection performance.

**Major context:**

1. There is a constant need for an Internet connection for the architecture to function normally.
2. Interface between software and hardware modules.

**ALGORITHM OF PROPOSED SYSTEM**

**Step 1:** A photo will be taken.

**Step 2:** Face detection is done from the captured photo.

**Step 3:** Obtaining the desired parameters from the photo.

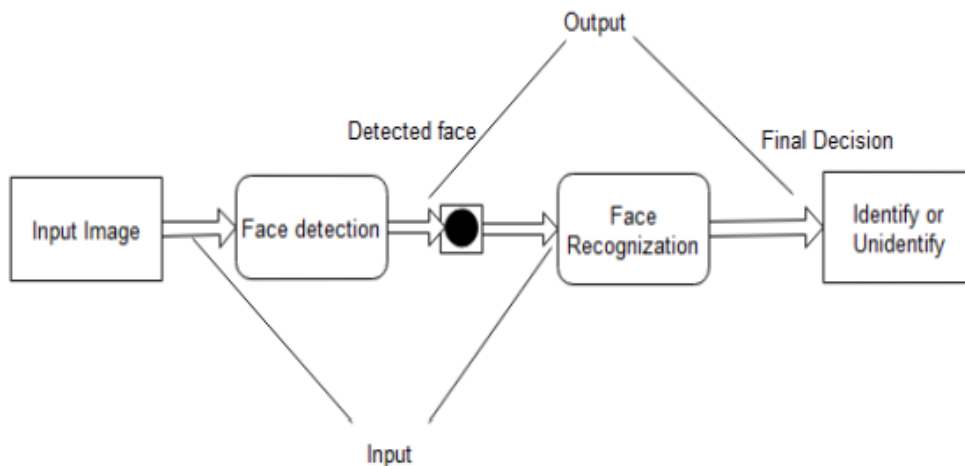
**Step 4:** Face recognition zooms in.

**Step 5:** The travellers invitation is sent to the owner via web, Android notification and many more.

**III.SYSTEM ANALYSIS**

**IMPORTANT DESIGN ASPECTS:**

1. The design of the Security System consists of the following modules:
  - Login and check profile (user)
  - Login (administrator)
2. User login and registration will be done using the following:
  - New user registration:
    - o Registration activity development: Python.
  - Log in
  - Login with registered email and password - DB Browser for SQLite.
  - DB Browser for SQLite is a Google cloud database that stores data in a table format. It is used as authentication, real-time database and storage



**Fig: System Architecture**

**IV.IMPLEMENTATION**

**Project Implementation**

- The proposed system architecture shown in picture is a security system based on the ethics of image recognition.



- The system consists of a camera, computer system along with internet connectivity. The whole working of the system starts with camera which connected to the computer system.
- In this project we use LBPH(Local Binary Pattern Histogram) algorithm. Local Binary Pattern Histogram is simple yet is very efficient texture operator which tables the pixels of an image by thresholding the neighborhood of each pixel and considers the result as binary number.
- After activation of the camera, it clicks the facial image of the person present in the range of camera.
- Detected image is then matched with the dataset saved in the computer system. If the image matches, then all the information of that person is sent to admin via email and if the image does not match, then the recently clicked image is sent to the admin via email. And then the further action taken from the admin.[4]
- As in the given description of proposed system, an idea of M2M (machine to machine) interaction based system which makes this system works in an efficient way.

• **Used tools and technologies**

1. Django framework: For designing user interface.
2. Python version 2.7 : For connecting modules.
3. Open CV: For image detection and recognition.

• **Methodology/algorithm details**

The following algorithm is used for face detection and recognition: LBPH (Local Binary Pattern Histogram) algorithm

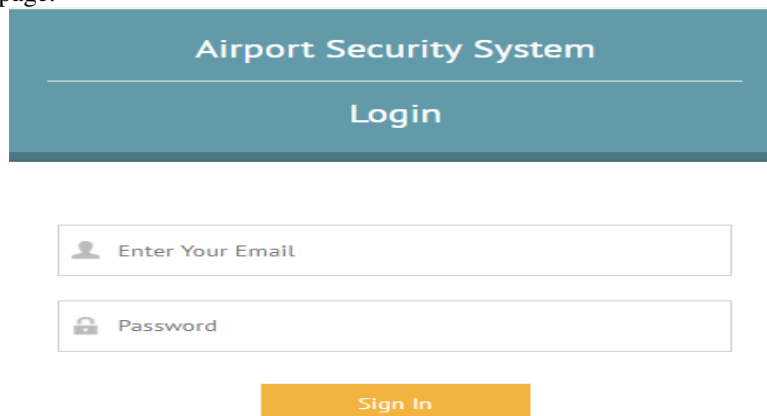
**V. RESULT**

```
C:\Windows\System32\cmd.exe - python manage.py runserver
Microsoft Windows [Version 10.0.17134.112]
(c) 2018 Microsoft Corporation. All rights reserved.

E:\PROJECT\PYTHON\airport_security_master>python manage.py runserver
Performing system checks...

CASCADE PATH :: E:\PROJECT\PYTHON\airport_security_master\static_cdn\Classifiers/
System check identified no issues (0 silenced).
April 18, 2019 - 12:04:29
Django version 1.10.7, using settings 'airport_security_master.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CTRL-BREAK.
```

1. Admin Login page:







## VI.CONCLUSION AND FUTURE SCOPE

With the major motive to prevent any malicious activity directed towards terrorism, security needs to tighten and face recognition is the best way to help tackle that. With the growing popularity of the face recognition software, nearly all countries will be actively using the technology at their airports and other places for security checks in the years to come.

As per the future implementation of our project we can make use of high sensitivity sensors such as the microwave and laser sensors instead of sensor as it may show irregularities in high temperature. Instead of using basic web camera we can use high resolution cameras which make use of more sensitive sensors that can helpful in low lighting environment. For better authentication we can use Aadhar database. The face detection system has emerged to be a user-friendly security system and is here to stay. India is also planning to incorporate the face recognition software at airports in the metropolitan cities for a start, to make security checks less of a headache, both for the people and the airport authorities. A lot of companies are coming into action and employing the face recognition software as a security system in their offices, the scale of which needs to be expanded. No compromises can be made when it comes to the security of a nation as a whole and face recognition is just the system that we need.

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