

Airport Security Using Face-Recognition

Prof. Rupali T. Umbare¹, Ms. Janhavi S. Takalgavankar², Ms. Harshada S. Yadav³ and Ms. Pruthvi A. Tilekar⁴

¹M. E. (CE)

*Department Of Computer Engineering. JSPM's
RSCOE. Pune, India.*

²*Department Of Computer Engineering.
JSPM's RSCOE. Pune, India.*

³*Department Of Computer Engineering.
JSPM's RSCOE. Pune, India.*

⁴*Department Of Computer Engineering.
JSPM's RSCOE. Pune, India.*

¹umbarerupali1@gmail.com, ²tajanhavi@gmail.com, ³harshaday64@gmail.com,
⁴prn1819@gmail.com

Abstract

Travellers need to carry passport, authenticated government proofs, and ticket whenever they travel through the plane. Also, there are plenty of cases of traveller's committing serious offenses and bankruptcy and later getting away by flying to other countries easily without any restrictions. our project focuses on the issue and has come up with a surveillance system that uses a camera for detecting the face and then images processing is used to identify whether the traveller is an authenticated passport holder or not. It also enables paperless traveling as our project uses a digital mode of operation. along with paperless traveling, surveillance is also performed by the system it will fetch the crime records and bank details of the person which helps us to know whether the person is prohibited to travel abroad or not.

Keywords: Camera, Image processing.

1. Introduction

Travellers need to carry passport, authenticated government identification proofs, and ticket whenever they travel through the plane. It may be the condition that travellers forget to carry any of this document then he/she will not be able to travel without regaining the documents. Paperless traveling is one such solution that will help to overcome such problems and make traveling much more convenient and will reduce paper consumption for this purpose. The identification of criminals and bankrupted people are also a huge concern. there are plenty of cases of traveller's committing serious offenses and bankruptcy and later getting away by flying to other countries easily without any restrictions. our project focuses on the issue and have come up with surveillance system which uses the camera for detecting the face and then image processing to identify whether traveller is authenticated passport holder system it will fetch the crime records and bank details of the person which help us to know about any serious crime or huge loan from the bank which prohibits that person to travel abroad. This will serve as the quick solution to the lengthy process that is performed to stop a traveller from traveling.

2. Ease of Use

A. Computer Vision

In this field of artificial intelligence that trains computers visual world. Computer vision in our project is used to first capture the face of traveller and detect it using algorithm then further recognise it by comparing it with images stored in our database and finally fetch the criminal records and bank details related to that specific person only.

B. Face-Recognition

Using this technology we will be able to first identify the image or the particular video frame of any video. The given facial features is mostly preferred in facial recognition with faces within a database

3. Literature Survey

A. Raisha Shrestha, Saurav Man Pradhan, Rahul Karn, Suraj Shresth, Tribhuvan University Lalitpur, Nepal.[1] Described that, for construction of face tracks, they have taken temporary models to pull out profile line given in progressive video block.

B. Mai Xu, Yun Ren, Zulin Wang, Jingxian Liu, and Xiaoming Tao [2] Described that, about stage, the focus is on identifying saliency of each profile outwardly either occlusion. If the profile is halted movies, the path leaves in modeling consideration the pattern of person consciousness. Against to grasp knowledge, it is concluded that programming performance of profile movie could additional development via eliminating emotive excess subsisting unimportant areas.

C. Bor-Chun Chen, Yan-Ying Chen, Yin-Hsi Kuo, Thanh Duc Ngo, Duy-Dinh Le, Shin'ichi Satoh, Winston H. Hsu.[3] Stated that Any useful and practical method – pack of-faces reprsssesentation to cipher pack of profiles into separate patterns. Comprehensive tests upon a coupled of actual datasets confirm that specific suggested techniques could not accomplish meaningful representation across former modern yet need enormously limited condition.

4. Design and Implementation

System Architecture - That is important to bring a passport; authorized ID card with travel pass. That will checked by system then only traveller can be allowed. People take huge amount of loan from banks or also commit any serious crime and can run away from country to other foreign countries.

So, the flow of our system is as follows:

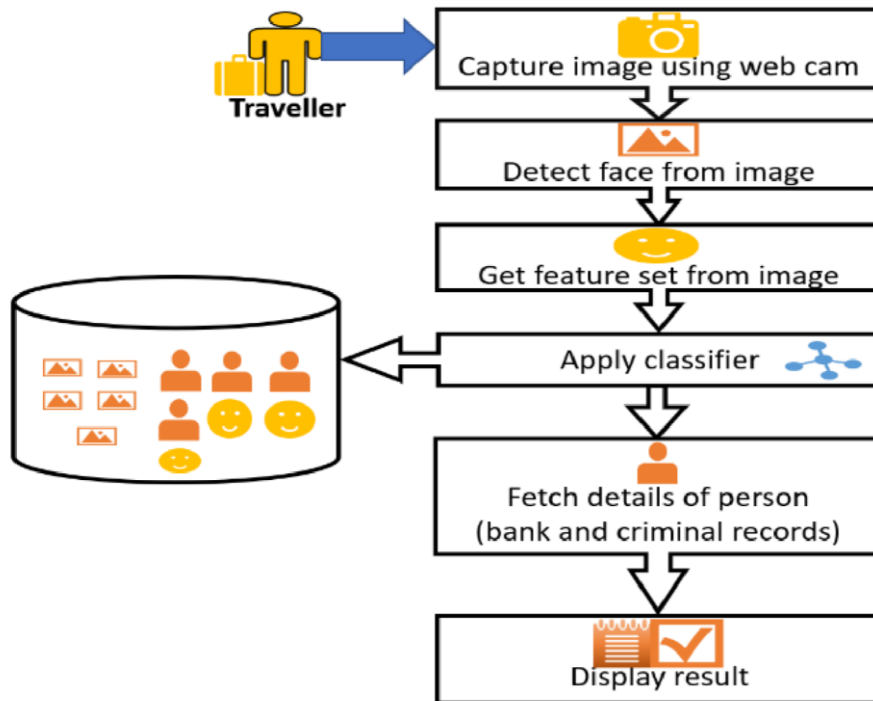


Figure 4.1: Flow of System

A. Mathematical models

1) LBPH has the following characteristics:

- Radius: to develop a circular local binary model radius is going to be used and around the middle pixel, the radius is specified it is usually set as 1.
- Neighbors: to build a circular local binary model we need sample features that sample features are neighbors. If we use 'a' number of sample features, then it results in a huge computational value. It is constantly set as 8.
- Grid X: here groups present in a horizontal orientation. To get a more accurate layer and high dimensionality of finishing feature vector we want more groups. Usually, it is set as 8.
- Grid Y: here groups present in a vertical orientation. To get a more accurate layer and high dimensionality of resulting feature vector we require more numbers. Usually, it is set as 8.

2) Training: First it is needed to train the model. So, to train the model we need record with profile about personages that require for recognition. requirement for placing set a unique evidence for each picture, so the algorithm going to use this data for the identification of input images and give us output data.

3) Operational phase: Applying the facial features we are going to receive the intermediate pictures which show or represents the actual image in the more conventional format. This is the very first computational initial phase of the LBPH algorithm. So, to do all this task the algorithm takes the help like concept moving pane.

Working off operational phase:

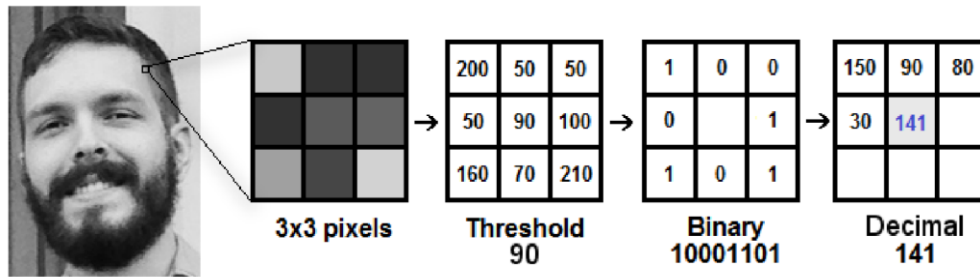


Figure 4.2: LBP Operations.

According to these above images, perform splitting of images Based on the photograph overhead, for more reliable perception break it into several small forms. Consider that facial image in grayscale

- Later breaking the image, it would have an image as a window in 3x3 pixels.
- That window in 3x3 pixels also depicted as a 3x3 mold with having intensity for each pixel (0~255).
- To use as the threshold, we require to take the central value of the mold.
- The value which we get this value is used to explain the latest principles from 8 bystanders.
- Then fix 0 or 1 towards bystanders as threshold worth. As worth similar or bigger compared to gateway
- let fix it as 1 and for values lower than the threshold set it as 0.
- therefore, we have binary values that are contained in the mold. Now we require to concentrate on every 0 or 1 • worth for every situation of a mold exact up to date unlike values of 0 or 1.
- After that we need to convert binary to decimal values and set that values to the midden worth for mold, specifically dotted from the actual figure.
- conclusion for these steps LBPH, get a latest figure that shows excellent properties for actual figure.
- The LBP phases extend various amount of radii and neighbor so mean as rounded LBP.

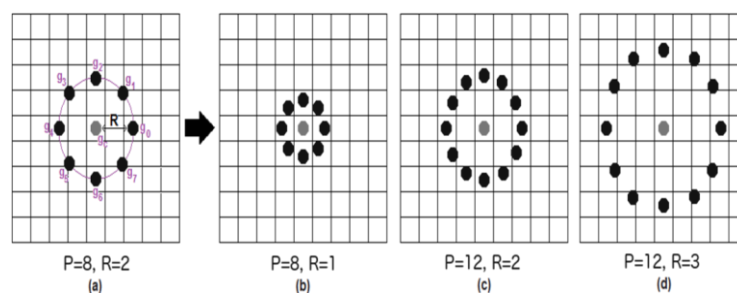


Figure 4.3: LBP Operations

It is done using bilinear interpolation. if incase the data points presents in linking dot, it takes utilize of worth from 4 close dot(2x2) to get the worth of recent collection. 4) Obtaining connected bar graph: Momentarily, working on figure created in the rear move, we can use the Grid X and Grid Y boundary to split the figure within recurring frameworks, while observed meanwhile resulting model:

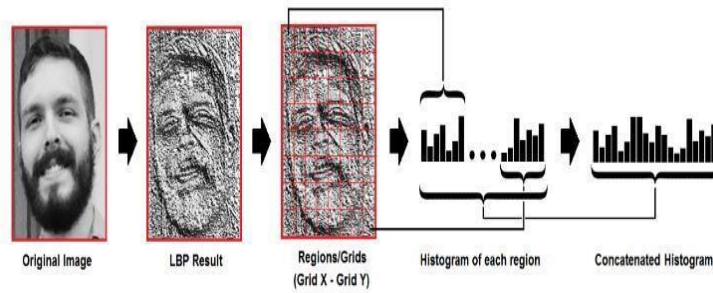


Figure 4.4: Obtaining Histogram

Construct on prototype over, we obtain the connected bar graph for every section go along with:

- Relatively, illustration in black and white, individually connected bar graph layer command contains exclusive 256 features (0~255) indicating the circumstances of any pixel depth.

- Next, expect to concatenate all histograms to make a modern and bigger histogram. Believing 8x8 layers, we hold $8 \times 8 \times 256 = 16.3$ feature concluding connected bar graph. The concluding connected bar graph implies features of figure first figure.

5) Working on face identification: Here, method is previously enlightened. A separate connected bar graph produced worn to mean everyone model from the enlightening record. Therefore, stated an information profile, complete move over such latest model and generate connected bar graph that expresses a single image.

- Now to get the model that corelate the information model, fair require to correspond two connected bar graph and represent the model among like the connected bar graph.

- By using Euclidean distance, we will corelate models based on the following formula:

$$D = \sqrt{\sum_{i=1}^n (hist1_i - hist2_i)^2}$$

B. Use-case diagram for Airport security :

As following,

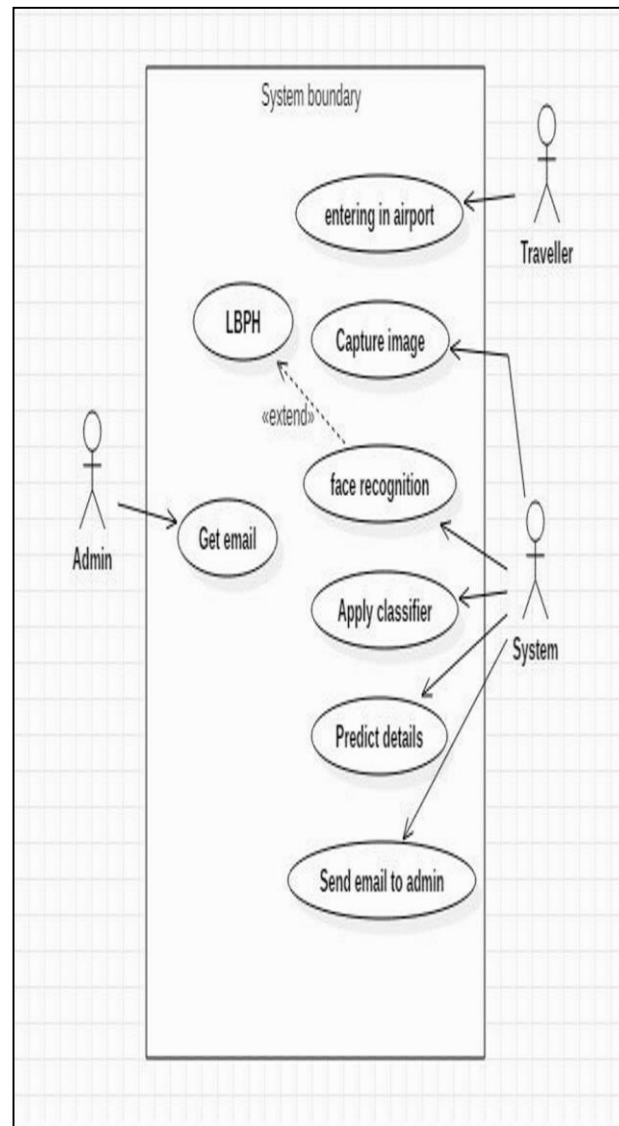
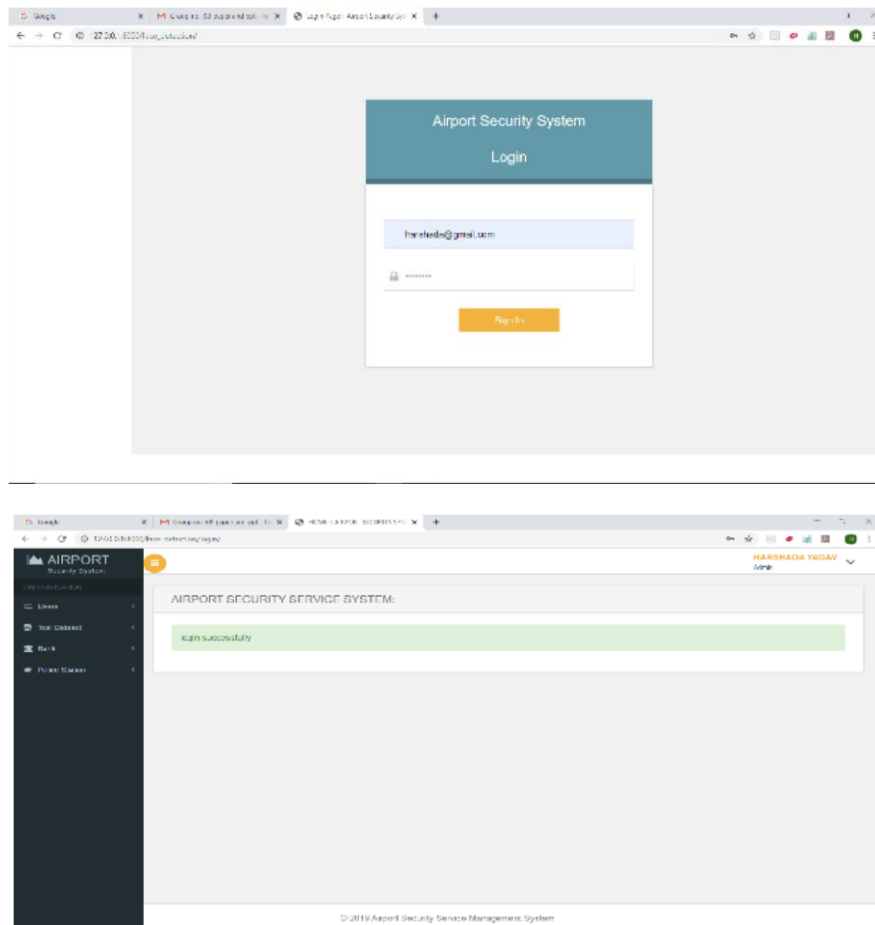


Figure 4.5: Use-case diagram for Airport security

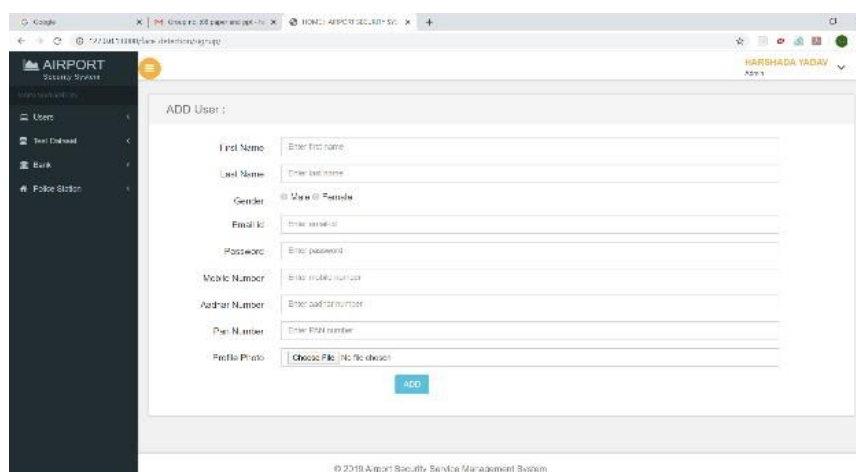
- Take Image from Web Cam: Camera continuously captures the traveler's image. Capturing of images is done using Face image capture module.
- Send Image to Server: Captured image send to the Django server.
- Get Feature Set from Image: LBPH is used for image processing and it gets feature set from image.
- Apply Classifier: By applying classifier the captured image is compared with the face images that are stored in the face dataset. And the classifier gets the trained images.
- Predict User Details: If the image is matched then the details of traveler is predicted.
- Send Email to Admin: The predicted users details are send to the admin through email.

5.Result and discussion

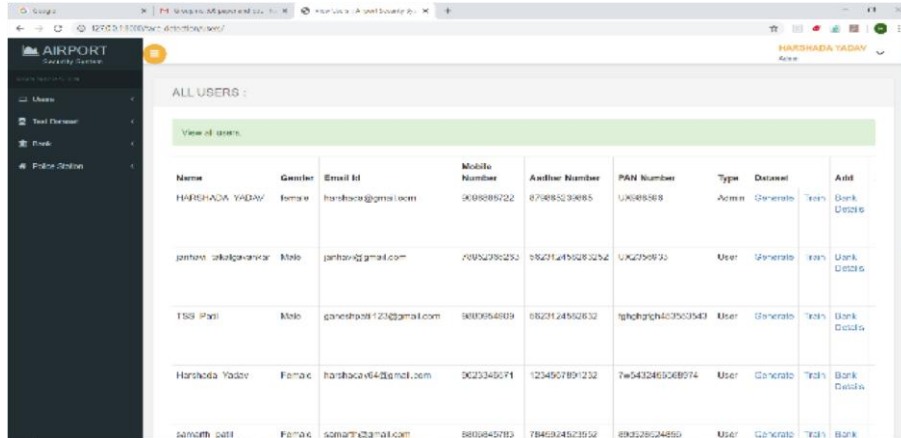
- **Login:**



- **Add Users:**

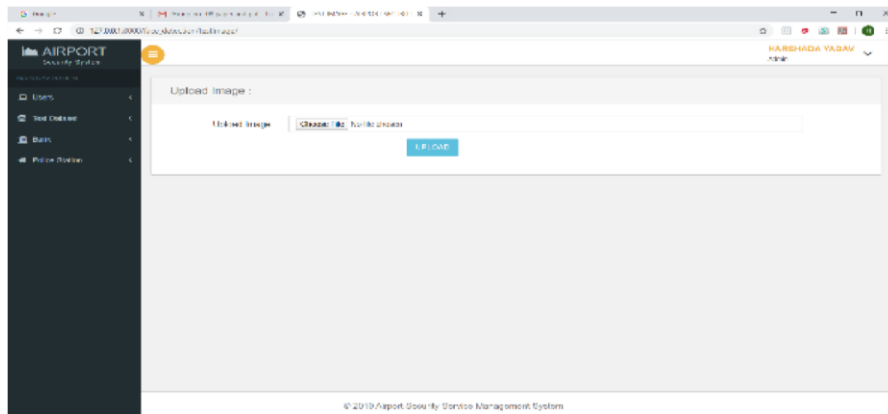


- **View Users :**

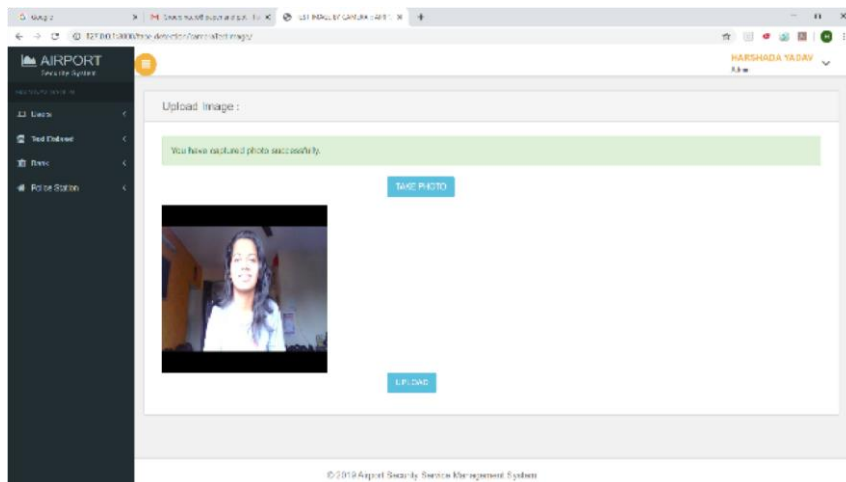


Name	Gender	Email Id	Mobile Number	Aadhar Number	PAN Number	Type	Dataset	Action
HARSADA YADAV	Female	harsada@gmail.com	909886722	879885239885	UK68858	Admin	Generate	Bank Details
jantani_ajitkumar	Male	jantani@gmail.com	7095275252	15231415525252	UK275553	User	Generate	Bank Details
TSS Pati	Male	ganeshpati23@gmail.com	980954609	6823124552632	tpghghgh43553543	User	Generate	Bank Details
Harsada Yadav	Female	harsada64@gmail.com	9023345571	1234567891232	7w5432456568974	User	Generate	Bank Details
sarathi_pati	Female	sarathi@gmail.com	8809845783	7845624523552	89328524850	User	Generate	Bank Details

- **Test Dataset By Uploading Image:**



- **Test Dataset By Taking Photo:**



- **Add Bank Details:**

ADD BANK :

Bank Name:

BANK ADDRESS:

Contact Number:

ADD

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- **View Bank Details:**

ALL BANKS :

View of banks.

Id	Name	Address	Contact Number
1	State Bank Of India	Kala park rd mumbai, Pimpri Chinchwad	9805381059
2	Bank Of Maharashtra	Shree Nagar	9833288722
3	BANK OF BARODA	PIMPRI	9123348571
4	BANK OF INDIA	MUMBAI	2605321472
5	BANK OF MAHARASHTRA	AJURDI	7945494705
6	CUNTIHAI BANK	PIMPRI	9033471204
7	PUNJAB NATIONAL BANK	CHINCHWAD	7545718253
8	UNION BANK	PUNE	7964121058
9	AXIS BANK	AJURDI	9857485255
10	KOTC BANK	PUNE	7405051308
11	KOTC BANK	MUMBAI	8047269488
12	KARNATAKA BANK	MUMBAI	9887433581
13	KOTAK MAHINDRA BANK	PIMPRI	9475886254

- **Add Police Station Details:**

ADD POLICE STATION :

Name:

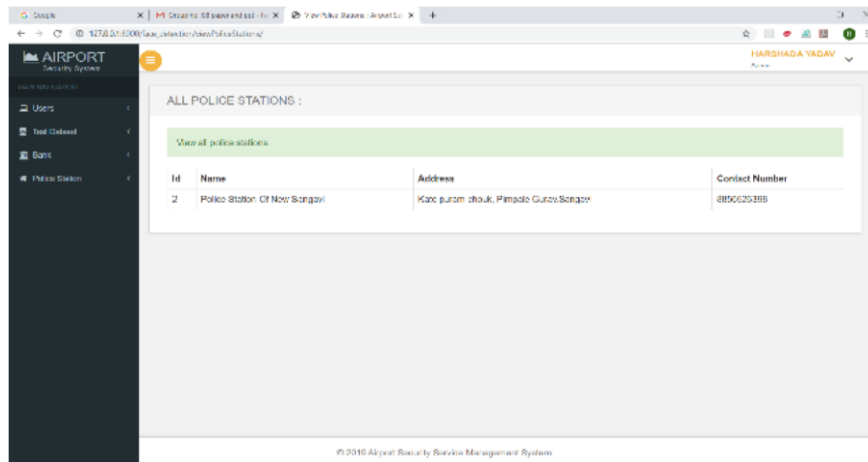
Address:

Contact Number:

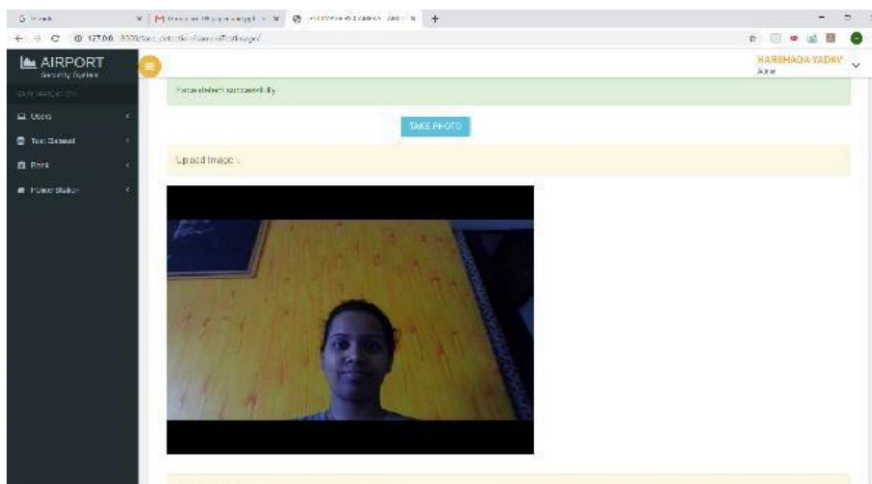
ADD

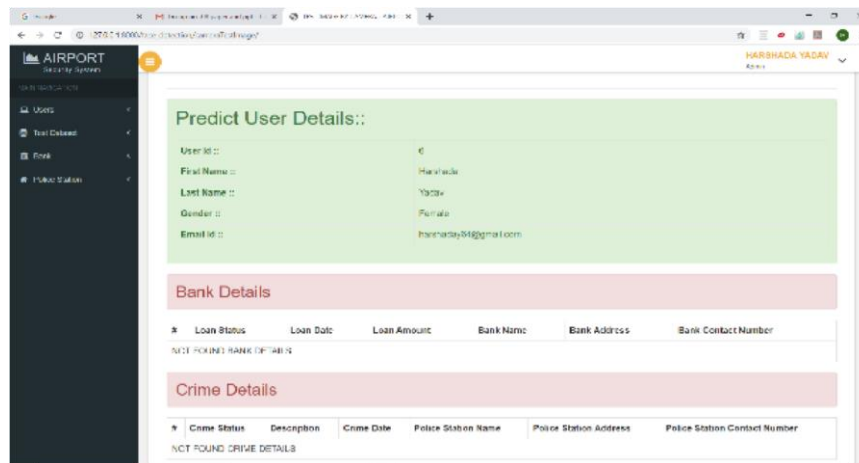
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- **View Police Station Details:**



- **Result:**





6.Conclusion

Now a day's security is the main aspect so, in this paper we implemented security with high level for Airports. Not only for paperless work it will helpful to detect the criminals who attempt to travel from one country to another after committing serious crimes and also detect if the traveler having loan from bank then traveler detailed information will be sent to police station for verification. For future scope will focus on more accuracy of traveler's identification by using biometrics for e.g.: Fingerprint.

Acknowledgment

The accomplishment of our entire project was not possible without the support and encouragement of our guide and our faculty. We feel very fortunate of having been given such a guidance. Everything Authors have achieved is due to their guidance and continuous efforts. We respect and thanks Dr. R. K. Jain, Principle and Dr. S. V. Kedar (HOD) of computer department, for giving us this opportunity to do the project work and giving us all support and guidance. Our deep thanks to our project guide Prof. R. T. Umbare, who helped us lead the way all along through the entire process of completing the plan. We are glad and lucky for continuous backing, help and advice from instructor from the section which assist gainful our project work.

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