IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

Motion Detection and Face Recognition for CCTV Surveillance System

(for Home security and ATMs)

[1]Neha Raut, [2]Ankita Chopade, [3]Shreeya Dayma, [4]Tejas Kulkarni

[1]UG Student, [2]UG Student, [3]UG Student, [4]UG Student

[1]Prof.Tejas Tambe,

[1]Computer Science,

[1]P K Technical Campus, Pune, India

Abstract : The need for rapid and accurate user identification and verification develops as the volume of electronic transactions grows. Users have learned to trust and depend on the Automatic Teller Machine (ATM) to meet their banking needs in a timely and convenient way. Despite the many advantages of the ATM system, ATM fraud has recently become more common. This method was devised to avoid ATM robberies and improper ATM use. We utilise an ultrasonic sensor and a face in the first section to validate the movement of an ATM machine. Face recognition technology is also used in this application to enhance home security. In both instances, a camera captures the facial picture of an item and, using a machine learning technique, determines if the thing is trustworthy or not. The message system is utilised to notify the authorised entity, and the next choice is made depending on his authority.

IndexTerms **- ATM security, CCTV applications, home security, image processing,face recognition, deep learning**

I. INTRODUCTION

Closed-circuit television (CCTV) systems are one of the security technologies that include features like email alerts and motion detection to address the problem of detection and monitoring. CCTV system surveillance is a well-known monitoring tool for physical and environmental security. Using video intelligence software, detects, identifies, and tracks the thing within range. Real-time events ensure that activities are limited to tasks and areas of responsibility that have been authorised. Suspicious behaviour, as well as other violations of established security standards and procedures, are recognised automatically. Sounds warnings and alarms based on user escalation procedures. Confidentiality is ensured via restricted user and role-based access. This app may be used at home as well as at ATM machines. A face recognition system is a computer software that automatically recognises or authenticates a person based on a digital image or a video frame from a video source. In the proposed approach, face recognition is employed to verify ATM systems. When it comes to face recognition, there are two types of comparisons. The first is verification, which involves the system comparing a given individual to who they say they are and returning a yes or no response. The algorithm compares a certain individual to all other persons in the database and generates a ranked list of matches in the following phase, identification. Face recognition software looks at the shape, pattern, and location of facial features. Face recognition is a difficult process that mainly depends on software. This Biometric Methodology uses the Convolutional Neural Network (CNN) algorithm to construct an analytical framework for each kind of biometric equipment. The process of face recognition starts with an image of a person. This may be done in a number of methods, such as using movement, skin tones, or blurred human shapes. Automatic teller machines (ATMs) are widely used in our daily lives due to their convenience, ubiquitous availability, and time-independent functionality**.**

II. Literature Survey

FPT Polytechnic College's Implementation of a CCTV-Based Attendance Taking Support System Using Deep Face Recognition [1]. The use of interior security cameras termed ATSS to construct and perform empirical comparisons of machine learning open libraries in creating attendance taking (AT) support systems. On the third floor of the FPT Polytechnic College building, our trial system was used to record the appearances of 120 students in five courses. Our design provides for flexible system scalability, and it may be used as a general attendance system with CCTV as well as for a school. The results of the measurements indicate that the accuracy is acceptable for a wide range of situations.

Face Recognition in Surveillance Camera Systems [2]. Because of the changing dynamic nature of face pictures, the face recognition process has several issues. As a result, a verifiable method for improving the quality of the recorded picture is presented, thus improving the efficiency of the face recognition system. The suggested system employs image enhancing methods to improve picture quality.

Enhancing the Features of CCTV to Improve Object Recognition and Security [3]. The CCTVs were used to try to enhance the security offered by them. Our system will not only record the events, but will also identify the danger and take appropriate action. To improve the security offered by CCTVs, we have incorporated OR (Object Recognition), an alert system, and other features in our system. Currently, CCTV systems are only capable of collecting images. They don't have the ability to recognise objects. However, we need a system capable of both collecting and identifying any kind of danger. Tensorflow Object Detection, Twilio (Communication API), OpenCV (Open Source Computer Vision), and MySQL Connector are among the technologies and APIs utilised in our system. As a result, we attempted to enhance the security and dependability of the CCTV system.

Video from Closed Circuit Television Cameras: Implementation of Intermediate Image Processing [4]. The taken surveillance footage and extracted frames from the video are subjected to automated colour balancing, interpolation on the sensor's filter, and gamma correction on each of these frames. The video is then recreated using the improved pictures. The video's quality is improved and finer once it has been processed. MATLAB is used to implement the suggested technique.

Smart CCTV Surveillance System with Live Streaming for Intrusion Detection [5]. a smart CCTV surveillance system that includes intrusion detection For live streaming and monitoring, several USB cameras have been placed in various places. When an unfamiliar face is discovered, this system conducts facial recognition as an authentication process and sends an email with a picture of the unknown face as well as an SMS to the owner. Smartphones and PCs can watch live feeds from numerous cameras.

Wi-Fi Wireless Sensor Networks are used in an IoT-based home automation system [6]. Introduce a Chatbot into a smart home application, allowing the Chatbot to act as a virtual butler at home. The robot will evaluate the user's requirements based on the text content of the chat to accomplish home environment monitoring and control functions via the conversation with the butler. Not only can the home automation system be successfully managed via conversations, but the residential environment can also be effectively changed to make the user's life more easy and comfortable.

In an automated attendance system, face recognition and interaction with an academic portal are combined [7]. It is feasible to use FR technology in schools to take attendance automatically. Attendance using the current camera system has many advantages, including saving time and effort, providing compelling proof for quality assurance and human resource management duties, and avoiding the spread of infectious illnesses. For the purpose of collecting attendance in the classroom, they integrated data from the academic site with several FR methods. Ngo and colleagues suggested limiting the scope of classification issues by employing several classifiers, each of which would be utilised exclusively for a particular set of students depending on their class schedule, as stated in the preceding section.

In the classroom, a computer vision-based application for student behaviour monitoring [8]. The goal of this study was to create a system that automatically assists instructors and other educational faculty in monitoring student behaviour. We focused on the students' observation goals throughout time. The system acts as a helper in the decision-making process. Strategic information may be automatically identified and provided to decision-makers. We completed the development of a comprehensive system that allows for the recording of student actions, the calculation of statistics, and the visualisation of the data. We presented development and experiment information, as well as evidence that combining model methods to solve the student-behavior-tracking problem is possible.

FACE - Face in the Classroom: Dataset and Exploration [9]. A technique for creating an image dataset that is customised to the educational setting. We have made our dataset and exploratory analysis accessible to the general public. Our dataset might be useful for studies in computer vision for academic applications, such as an automated student attendance system. Face detection is a job that involves determining whether or not there are human faces in a given picture and, if so, determining the position of each face. Deep Learning and Perspective Correction Techniques are used to create a room monitoring system. [10]. Deep learning and perspective correction methods are used to create a room monitoring system. It also presented a novel person identification method that combines the Mask R-CNN scheme with the tile technique, as well as two bounding box merging techniques. This research compared the proposed Mask R-CNN + Tiles method against the MobileNet-SSD, YOLO v3, and Mask R-CNN strategies for person detection. In terms of detection accuracy, MAE, and RMSE, the suggested method beat the MobileNet-SSD, YOLO v3, and Mask R-CNN techniques

III. Prposed system design

We are proposing to create a mobile motion detection and face recognition system that would help the people to use it for home security as well as in ATM's. In the proposed system (for home security) we recognize the face of the person and match it with given data, if person's data isn't available an alert Email, Sms and Mms is sent to the registered profile. Also, for the ATM service, if the ATM machine is displaced from the given range sound alerts will be given. The whole and soul purpose of our system is the security, and makes it easy to access for the users.

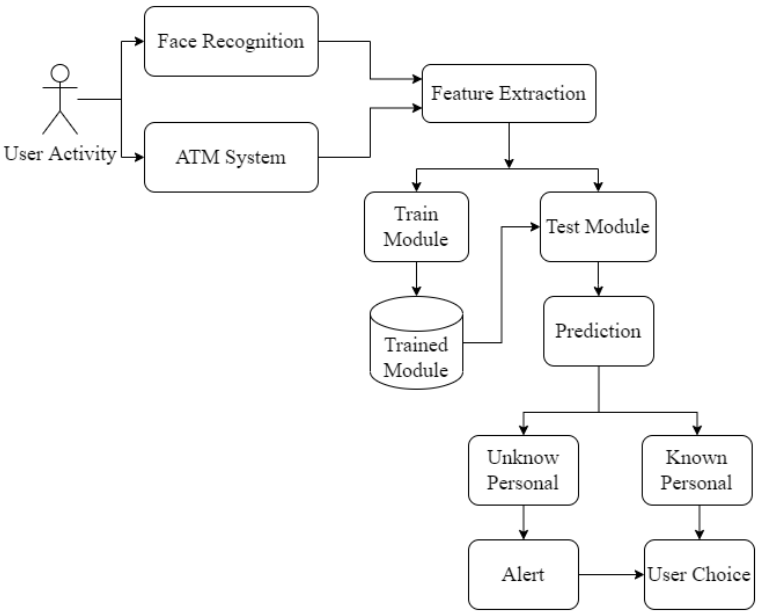


Figure 1 : Proposed system architecture

IV. Algorithm Design

- **Input:** Selected feature of all test instances D[i….n], Training database policies {T[1]…….T[n]}
- **Output:** No. of probable predication with weight and label.

Step 1: Read (D into D[i])

V←Extract features (D)

Step 2: N←Count Features (D)

Step 3: for each(c into Train_DB)

Step 4: Nc[i]←Extract Features(c)

Step 5: select relevant features of w= {Nc[i], N}

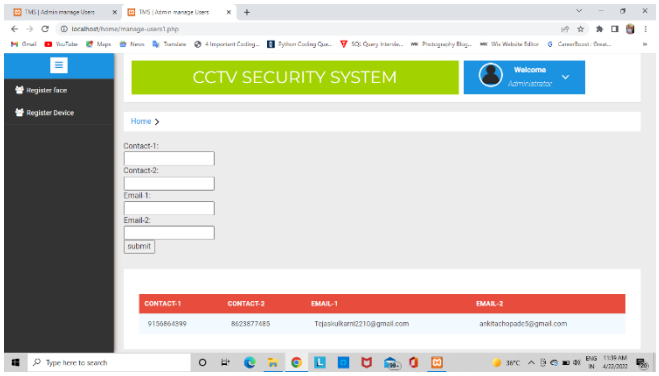
Step 6: Statement (w>t)

Step 7: Return Tree Instance {Nc[i], N, w, label}

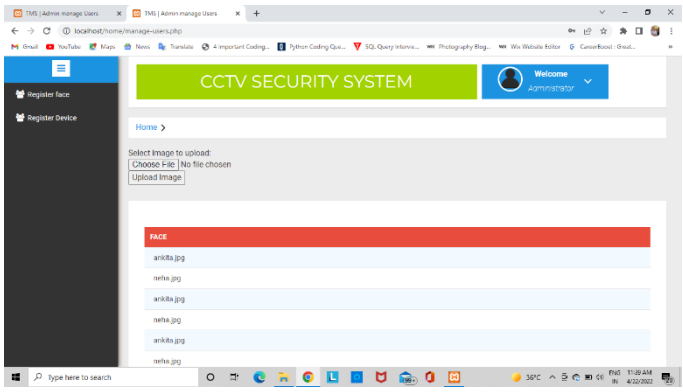
R < 1 means APT is more strongly supported by data under consideration than CAPM.

V. RESULTS AND DISCUSSION

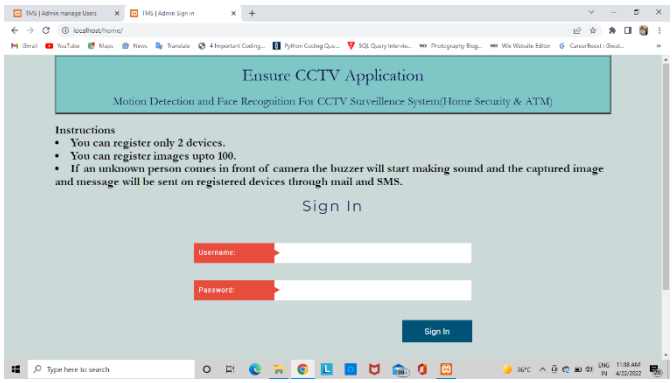
5.1 For Home (Home page interface)



1



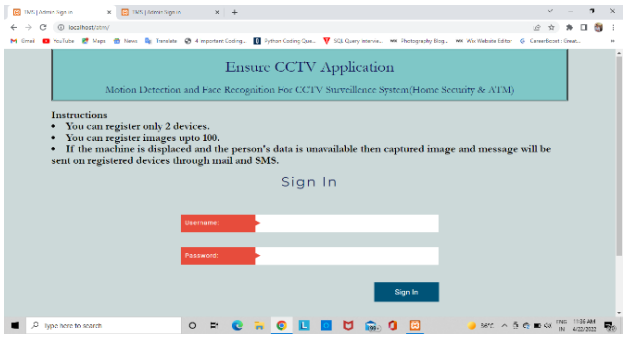
2



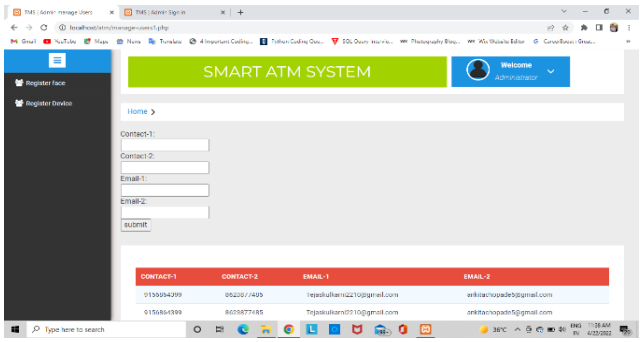
3

Above snaps shows the process in the web application for home security.
1. Shows signin page with some basic instructions.
2. Shows register device portal where user can register the device and registered information is available.
3. Shows register face portal, user can register images of the known person and registered information is available.

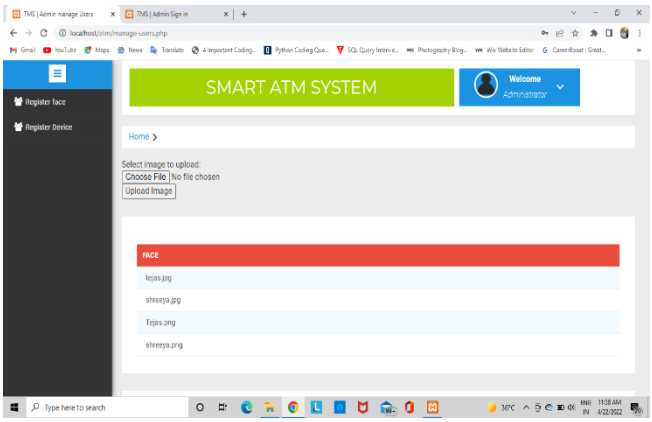
5.2 For ATM (Home page interface)



1



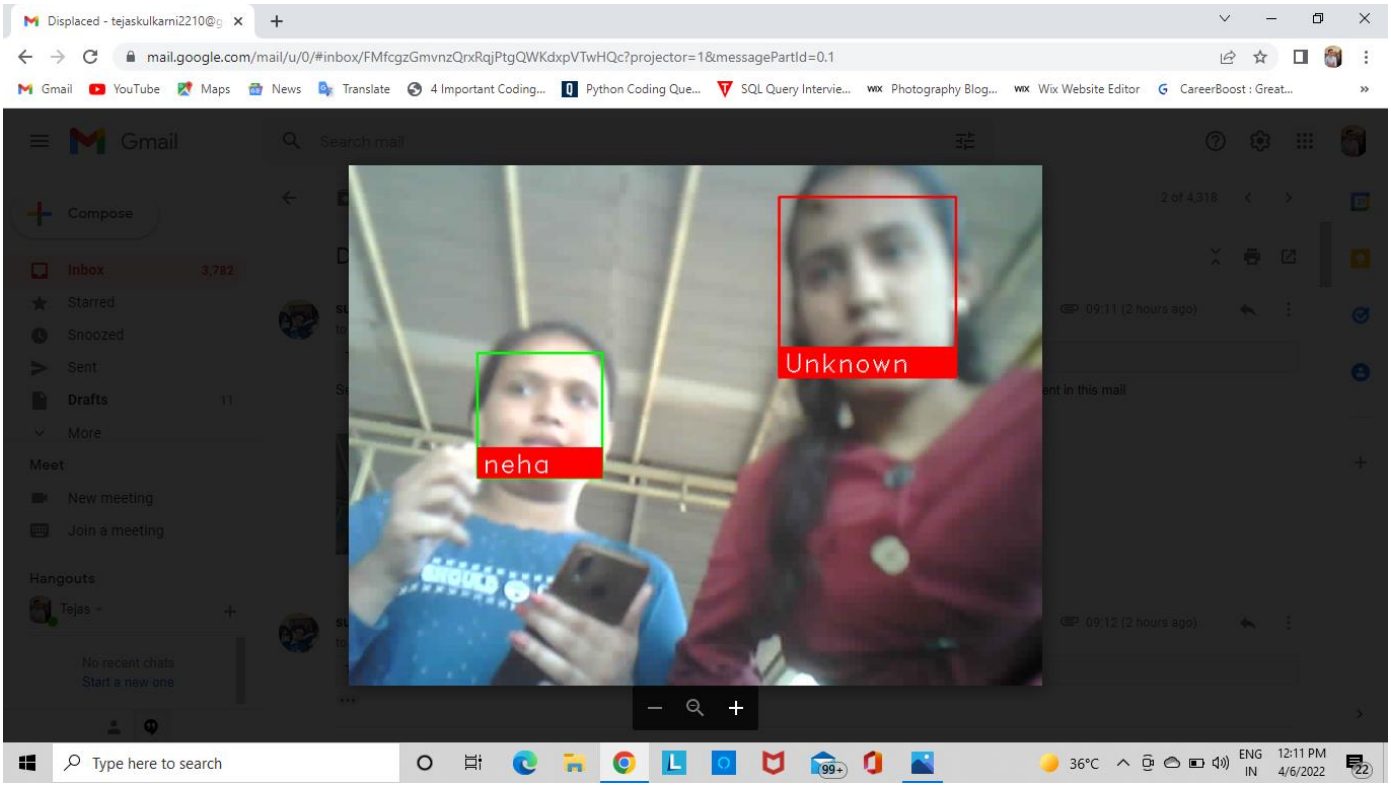
2



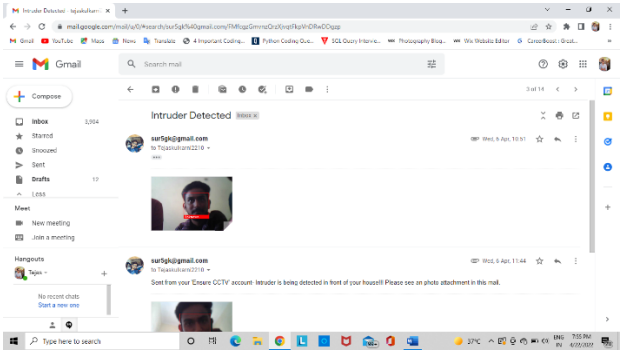
3

Above snaps shows the process in the web application for atm.
1. Shows signin page with some basic instructions.
2. Shows register device portal where user can register the device and registered information is available.
3. Shows register face portal, user can register images of the known person and registered information is available

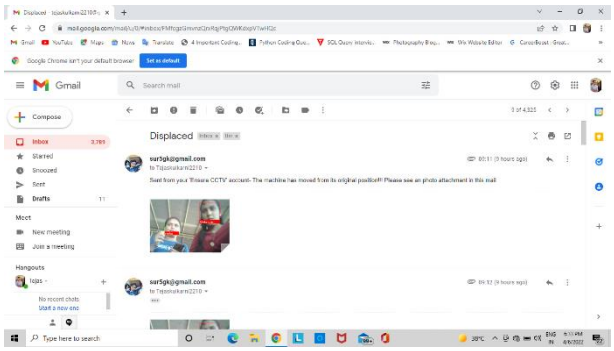
5.3 Model detects known , unknown faces for both modules ATM and Home respectively.



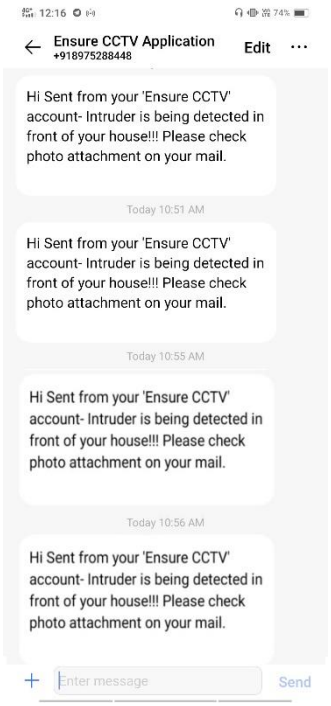
5.4 Model sends alert notifications to register mail id and SMS to register mobile number.



(a)Alert mail with photo attachment for Home module



(b) Alert mail with photo attachment for ATM module



(a)Alert SMS for Home module

(b) Alert SMS for ATM module

VI. CONCLUSION

This research is conducted by designing and testing motion detection and face recognition on a CCTV video. Motion detection using ADI (analysis design implementation) method and Haar classified cascode used for face recognition. For this system mainly provides an efficient method for surveillance purpose and is aimed to be highly beneficial for any person or Organization

REFERENCES

[1] Son, Ngo Tung, et al. "Implementing CCTV-based attendance taking support system using deep face recognition: A case study at FPT polytechnic college." Symmetry 12.2 (2020): 307.

[2] Celine, Jinu. "Face recognition in CCTV systems." 2019 International Conference on Smart Systems and Inventive Technology (ICSSIT). IEEE, 2019.

[3] Kanyal, Hoshiyar Singh, et al. "Object Recognition and Security Improvement by Enhancing the Features of CCTV." 2020 9th International Conference System Modeling and Advancement in Research Trends (SMART). IEEE, 2020.

[4] Vinod, Karthik, et al. "Implementation of Intermediate Image Processing for Video from Closed Circuit Television Cameras." 2020 International Conference on Communication and Signal Processing (ICCSP). IEEE, 2020.

[5] KH, Akshay Bharadwaj, et al. "Smart CCTV surveillance system for intrusion detection with live streaming." 2018 3rd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT). IEEE, 2018.

[6] Tseng, Chwan-Lu, et al. "An IoT-Based Home Automation System Using Wi-Fi Wireless Sensor Networks." 2018 IEEE International Conference on Systems, Man, and Cybernetics (SMC). IEEE, 2018.

[7] Son, Ngo Tung, et al. "Combination of facial recognition and interaction with academic portal in automatic attendance system." Proceedings of the 2019 8th International Conference on Software and Computer Applications. 2019.

[8] Ngoc Anh, Bui, et al. "A computer-vision based application for student behavior monitoring in classroom." Applied Sciences 9.22 (2019): 4729.

[9] Karnalim, Oscar, et al. "Face-face at classroom environment: Dataset and exploration." 2018 Eighth International Conference on Image Processing Theory, Tools and Applications (IPTA). IEEE, 2018.

[10] Ngo, Huu-Huy, et al. "A Room Monitoring System Using Deep Learning and Perspective Correction Techniques." Applied Sciences 10.13 (2020): 4423.