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ADVANCED AI ATM SECURITY SYSTEM USING AI/ML TECHNIQUES

D. Sriramu[1], R. Dharshanadevi[2],R. Mithunvasanth[3],T. Ravichandru[4]

[1,2,3,4](Department of Information technology, UG scholar, KSR Institute for Engineering and Technology, India)

Ms.T.Nandhini M.E ,Assistant professor/IT, KSR Institute for Engineering and Technology, India

Abstract*— With this Advanced AI ATM Security System, the safety of users using the ATM and safety of ATM machines will be ensured effectively. The Artificial Intelligence and Machine Learning plays a major role in this AI ATM Security. By this Advanced AI ATM safety, the theft and robbery of ATM will be reduced effectively.

Keywords—ATM, Artificial Intelligence, Safetyand Security.

I.INTRODUCTION

The security of ATM Machine is very important as theft may occur anytime on any ATM machines. Particularly, ATM machines in rural areas will be affected and theft is being happened many times. With this Advanced AI ATM Security System, the user/customer using ATM services will be monitored completely with his/her actions and the unusual activities will be notified with an Alarm to public and local police station. The Advanced AI ATM Security system uses the ATM's security camera to monitor the customer actions completely through Artificial Intelligence and Machine Learning.

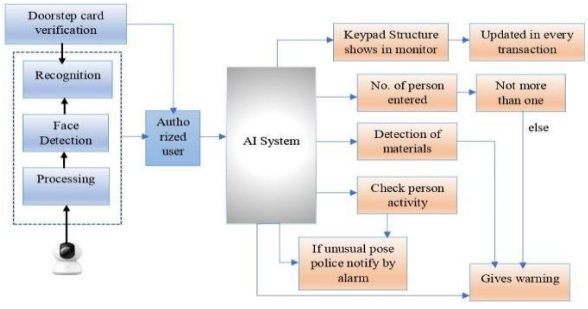
By using this Artificial Intelligence, the system will focus the safety of the user as well the ATM machine. The System will recognize and authenticates the user's face whether they registered and if the third person using the user's ATM card, the user will be notified by the SMS alert. Through AI the continuous monitorization is done and the person entered into the ATM will not exceedingly more than one. If they using any metals or objects inside means the system will give the warning to them and the system makes the alarm if they do any illegal or unusual activity.

II. LITERATURE SURVEY

The robbery in the ATM Machine will never happen anymore. The Advanced AI ATM Security system will take care of the security of the ATM Systems and the users using the ATM System. The user using the ATM System may be attacked by third person and steal their money. But with our Security system, the security of both the users and ATM system itself is protected in an enhanced way. Our AI Security system will monitor the actions happening inside the ATM room and provide alerts.

Enhanced security for ATM machine with OTP and Facial recognition features by Mohsin Karovaliya, Saifali Karedia, Sharad Oza, Dr. D. R. Kalbandi paper has helped us for this project's modules 1 and 2, authenticating ATM users with multiple secure login systems.

III. BLOCK DIAGRAM

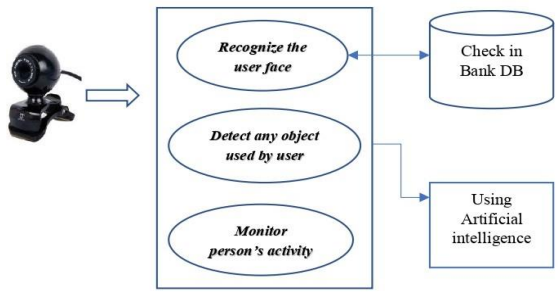


IV. MODULE DESCRIPTION

QR CODE SCANNING— QR code- "Quick Response" code. Nowadays, a QR code is applied in different applications related to academics, marketing,

security, payment etc. and gain popularity at a high pace. Day by day more people are getting aware of this QR codes and use it accordingly. In our Project, we have done the ATM Card QR Scanning before entering inside the ATM. The popularity of QR code grows rapidly with the growth of Smartphone users and in our system after scanning with the ATM card the card holder will get the SMS.

FACE RECOGNITION--Face recognition system is an application that identifies a person from a digital image source. The face data and biometric data of the user should be stored in the bank database to use this functionality. The user entered the ATM will be detected with his face registered. And if the face is not matched with the database, then the ATM machine will not cash out. An SMS alert "Your ATM card is used by third person" will be sent to the user's mobile automatically. This reduces the risk of some fraudulent transactions in the ATM's. Banks can also verify the user's later to find all the transactions.



OBJECT DETECTION—Object detection is a computer vision technique for locating instances of objects in the CCTV camera. Object detection algorithm typically leverage machine learning or deep learning to produce meaningful results. Similar to facial recognition, surveillance cameras of the ATM can be trained to detect out-of-place objects inside the outlet. In the modern Technology, by using the Artificial Intelligence package, in case the detection of any Suspicious object or material has been detected in the ATM's security camera means it will give the simple warning to the user who are using the ATM. Then if it persists, i.e., the suspicious objects are used again, then the alarm will go off. The metal detector is also used in the ATM's entrance to detect the metal objects. The examples of suspicious objects include knife, crowbar, hammers, and so on.

PERSON COUNT—Deep Learning with Artificial Intelligence is used to detect number of persons entered the ATM. An AI in the CCTV camera has the ability to perform a bunch of different functions with the right deployed commands. These cameras can detect body actions of customers inside the ATM unit, realize the presence of more than one person and take required actions. If more than one person entered the ATM, it gives a simple warning message to the user to protect them. The second person entered the ATM will be constantly checked for his actions, and if second person disturbs the person in any way, the alarm will go off.

FIND SUSPICIOUS ACTIVITY—Human Pose Estimation (HPE) is a way of identifying and classifying the joints in the human body. Essentially it is way to capture a set of coordinates for each joint (arm, head, torso, etc.,) which is known as key point that can describe a pose of a person. The connections between these points are known as a pair. The activities of human entered the ATM, his poses will be monitored constantly with the help of Human Pose Estimation in the ATM's security camera. Any unusual behavior or actions of a person will be warned with the first time. And if he/she does the same again, the alarm to the police and notifications to the public will be sent automatically. Illegal or unusual poses includes the person trying to break the items in the ATM, the second person entered the ATM trying to disturb the person, and so on.

KEYPAD STRUCTURE UPDATION--The user after inserted their ATM card in the ATM machine, needs to validate his identity with his PIN number. The PIN number is a 4-digit number that user sets for his own. The pin input keypad in the ATM will be static and this may lead to leakage of user's PIN number to others as it is visible to neighboring person in the ATM. So, in our project,the pin input will be showed on display and the structure of pin input will be updated on every transaction dynamically and automatically. This will prevent the PIN number to be leaked to others.

SERVICE TECHNICIAN—The service technician of ATM's is responsible for handling offunds. In other words, ATM technicians are responsible for maintain and repairing ATM's, changing cash loaded on the machines, installing new machines, etc., are the activities included for the service technicians. The service technician should have the ability to work inside the ATM, so his actions or behavior should not be detected inside the ATM. The face data of service technicians will be stored in the bank server and if the technician entered the ATM, the security camera automatically detects his face and turns off all other activities (counting number of persons, detecting actions or poses, and so on) and closes the door. Once he left the ATM, it again turns on all the activities. And so, he can do his maintenance work freely.

4.8 ATTACKING SECURITY CAMERA-- Artificial Intelligence detects the person trying to cover the security camera of ATM or trying to disconnect it or trying to attack it. If any user tries to attack the security camera of the ATM, it is considered as unusual pose and the alarm will be activated immediately. The CCTV camera will be protected from damage and requires constant maintenance.

V. ARTIFICIAL INTELLIGENCE & MACHINELEARNING

Artificial Intelligence(AI) is the process of human intelligence. In general, AI systems work by ingesting large amount of labeled training data, analyzing the data for correlations and patterns, and using these patterns to make predictions about future states. In this way, an image recognition tool can learn to detect the objects and classify them accordingly. Machine Learning is a branch of artificial intelligence and computer science which focuses on the use of data to imitate the way that humans learn, improving its accuracy gradually. Our Advanced AI ATM Security System works with the help of ATM's security camera with Artificial Intelligence and Machine Learning. Our AI ATM Security system works only with help of ATM's security camera, raising the question of how it works, if the user disconnects the camera. To explore this question, the user enters the ATM need to verify his ATM card in the door, which means their entry will be stored in the database. And if he disconnects the security camera, then his identity will be easily tracked with his data stored in the database. So, there is no way to disconnect the security camera.

CONCLUSION

Our work on predicting human actions and poses, counting the number of persons entered the ATM, detection of registered faces with the face data, detection of objects, changing the pin input keypad structure will provide the full security to both the ATM machines and users. With our project, the theft, robbery, and all other illegal actions will be prevented. If these illegal activities happened, the thief will be easily identified with his face registered which means the police investigation will also be reduced.

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