



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

**Volume 9, Issue 6, June 2021**

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.542**



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

# Bank Locker Security System using Machine Learning with Face, Liveness Detection and OTP Verification

Navnath Kumbhar, Raj Gholap, Wasib Shaikh, Gaurav Pandey, Prof. R. M. Kedar

Department of Computer, K J College Engineering And Management Research Pisoli, Pune, India

**ABSTRACT-** Security and Authentication of individuals is necessary for our daily lives especially in Bank lockers. A smart digital door lock system for bank automation is equipment that uses digital information such as a user's data, voice detection, and face recognition as the method for authentication in the system. In this system the bank will collect the biometric data of each person for accessing the lockers. Only authenticated people can recover the money, documents from the lockers as biometric and faces are stored for the individual identity of a person.

**KEYWORDS** - digital door lock, liveness Detection, Security, CNN

## I. INTRODUCTION

Today, passwords, ID cards and PIN check techniques are being used in Bank locker system. The obstacle is that the passwords could be hacked and a card may be stolen or lost. The most secured system is an interesting imprint affirmation in light of the fact that a one of a kind finger impression of one individual never organizes the other. Usually, when a person visits a bank, there is a security guard employed by the bank to make sure that the person entering the locker is legitimate and is accessing his locker only. But the present arrangement has a few loopholes and also requires manpower. The idea is to create a device that can detect the face of the person and match it with the database. In case of a mismatch, it can send a notification to the concerned person and authorities.

## II. LITERATURE SURVEY

In [1], a bank locker security system is developed. Using this system, banks can ensure the security of the lockers of its customers. In case someone tries to break into someone else's locker, this system will send a notification to the customer, bank authorities and if needed, police as well.

In [2], a smart locker has been designed for banking sector. The main feature of this work is it keeps track of time, date and number of access of locker by a user in the bank. The smart lock program will compare your image and fingerprint with the data already stored in the database. After checking the authenticity of the user, the microcontroller (Arduino) will give signal to the lock and it will open. It also gives a message when the number of permissible access turns increases in a given duration.

In [3], an application is developed which advises that we need to secure our bank locker security framework by making some technique somewhat simple and more efficient for the bank. This is only a model display if actualized would definitely give a decent security to the locker controlling theft and making the locker more secure. The confirmations this framework will create for the customer will be used for constantly protect the locker from any burglary. This process makes the work heap of the bank very less yet makes it simple too.

The objective of [4] is to design a bank locker security system which is using Face Recognition, Iris Scanner and Palm Vein Technology (PVR) for securing valuable belongings. A face recognition system is a system which identifies and authenticates the image of the authorized user by using MATLAB software. The images of a person entering a unrestricted zone are taken by the camera and software compares the image with an existing database of valid users. Iris Recognition system uses generous characteristics present in human body. This technology is employed for biometric authentication in ATM's, Immigration & border control, public safety, hospitality and tourism etc. This paper serves techniques so that capability of palm vein recognition system can be improved using modified vascular pattern thinning algorithm. Palm Vein Recognition (PVR) is a technology which recognizes palm vein pattern of an individual and matches it with the data stored in database for authentication.

In [5], a security system is developed for transporting or storing valuable while restricting unauthorized access. The system consists of Memory Module, PIR sensor, fingerprint security, Encoder-Decoder, RF module, GPS and GSM module etc. to provide the maximum level of security. The proposed security system can be a major uplift in transporting important documents, money or ornaments from one place to another especially for banks in transporting valuables as the proposed security system is designed in such a way that the vault can only be opened by an authorized person, in specific places, using proper credentials, hence providing maximum security.

In [6], an enhanced security solution is proposed for industry grade safety vault system. Electronic security and safety have been offering robust mechanism for implementation in ensuring proper shelter of key documents and goods in offices, banks, institutions, libraries, laboratories etc. Development of various sensors has enabled systems to have preventive and corrective measures in this regard significantly. In order to deliver a concrete security solution for critically important and confidential documents and goods, we proposed an Automated Safety Vault with Double Layered Defense Mechanism. The solution comprised of an Electronic Lock driven by password verification and a Biometric authentication for users using a Fingerprint scanning and sensing tool. Both of these two layers ensured the authenticity of the user by preventing any unauthorized access to the Vault. Moreover, actions of PIR and LDR sensors would also safeguard the vault from any breakout access other than the double layered defenses by being positioned within the periphery of the vault. The system was then implemented in a prototype scope for testing and validation of the proposals.

### III. PROPOSED SYSTEM

We analyzed what is the problem people faced in the existing technology. This project helps to overcome the problem of complexity and provides easiest way to secure the bank locker. Block diagram of proposed system is as shown in figure. Camera is used for authentication of locker's owner. We are using Keypad and camera of PC/laptop. Whenever a person enters in bank, camera captures image and display information about him. GUI (Graphical User Interface) is developed for user and system interactions. An OTP, which along with face recognition comprises two levels of security. When face and OTP are matched then customer's locker will open. GUI will display user name, debited money, authentication status etc.

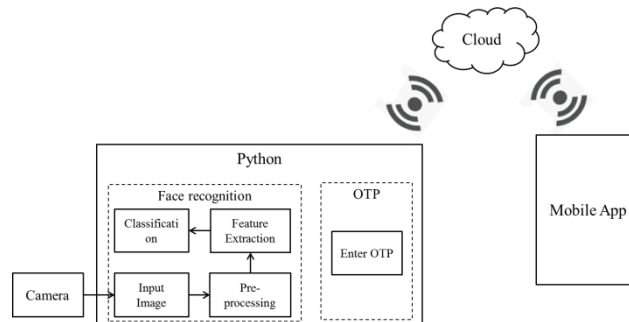


Fig.1 block diagram of proposed system

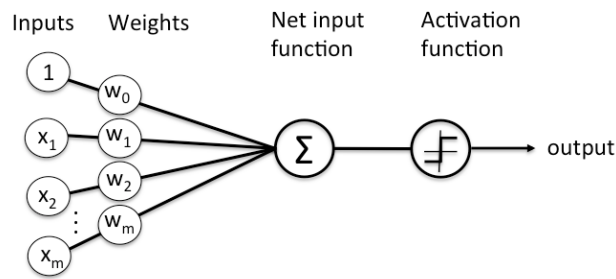
Image processing: Input to the system is image captured by camera. Pre-processing images commonly involves removing low-frequency background noise, normalizing the intensity of the individual particles images, removing reflections, and masking portions of images. Image pre-processing is the technique of enhancing data images prior to computational processing. Feature extraction involves reducing the amount of resources required to describe a large set of data. When performing analysis of complex data one of the major problems stems from the number of variables involved. Feature extraction is a general term for methods of constructing combinations of the variables to get around these problems while still describing the data with sufficient accuracy. Image classification refers to the task of extracting information classes from a multiband raster image. The resulting raster from image classification can be used to create thematic maps. Depending on the interaction between the analyst and the computer during classification, there are two types of classification: supervised and unsupervised.

#### Algorithm -CNN

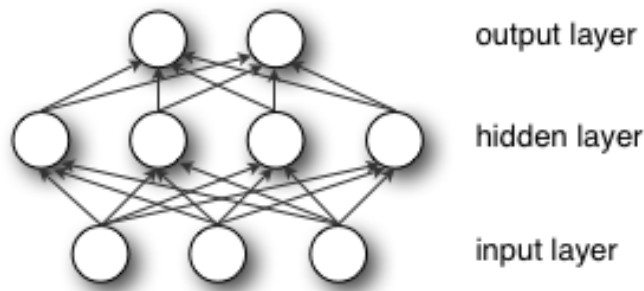
Profound learning is the name we use for "stacked neural organizations"; that is, networks made out of a few layers. The layers are made of hubs. A hub is only where calculation occurs, inexactly designed on a neuron in the



human cerebrum, which fires when it experiences adequate boosts. A hub joins contribution from the information with a bunch of coefficients, or loads, that either enhance or hose that info, consequently allocating importance to contributions concerning the errand the calculation is attempting to learn; for example which info is most useful is grouping information without blunder? These information weight items are added and afterward the aggregate is gone through a hub's alleged actuation work, to decide if and how much that sign should advance further through the organization to influence a definitive result, say, a demonstration of grouping. On the off chance that the signs go through, the neuron has been "actuated."



A node layer is a row of those neuron-like switches that turn on or off as the input is fed through the net. Each layer's output is simultaneously the subsequent layer's input, starting from an initial input layer receiving your data.



Pairing the model's adjustable weights with input features is how we assign significance to those features with regard to how the neural network classifies and clusters input.

Artificial Intelligence has been witnessing a monumental growth in bridging the gap between the capabilities of humans and machines. Researchers and enthusiasts alike, work on numerous aspects of the field to make amazing things happen. One of many such areas is the domain of Computer Vision. The agenda for this field is to enable machines to view the world as humans do, perceive it in a similar manner and even use the knowledge for a multitude of tasks such as Image & Video recognition, Image Analysis & Classification, Media Recreation, Recommendation Systems, Natural Language Processing, etc. The advancements in Computer Vision with Deep Learning has been constructed and perfected with time, primarily over one particular algorithm — a Convolutional Neural Network.

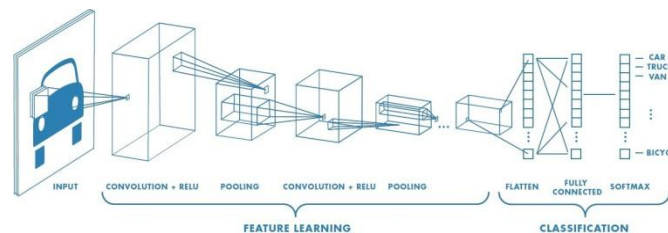
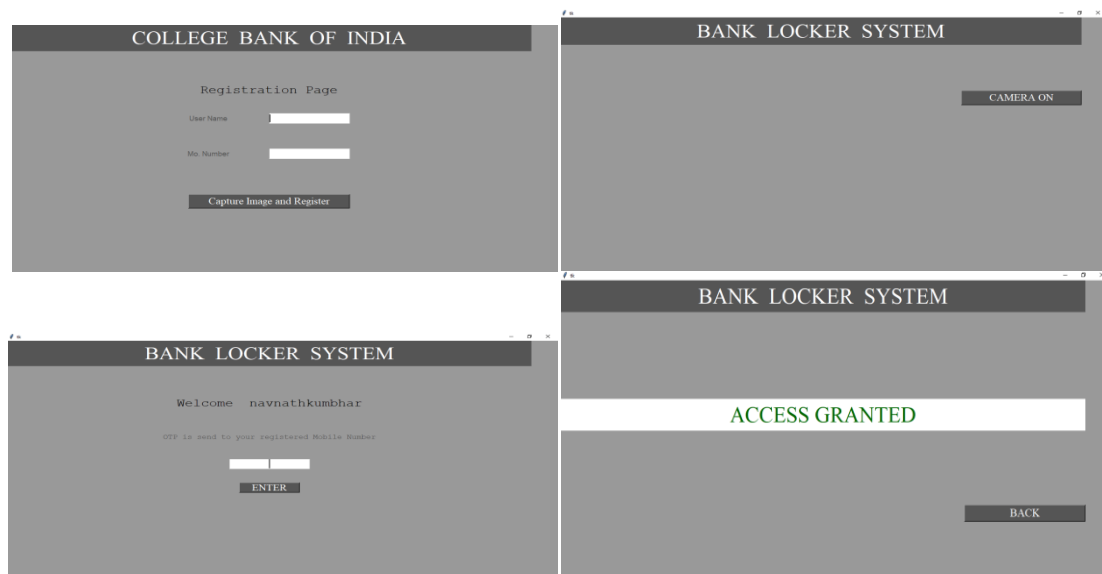


Fig 2 Architect CNN

A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other.

### III. RESULTS



### IV. CONCLUSION

Implicit guarantee of your money inside the bank being safe has usually been the reality of concern. This project plays a first-rate function in maintaining the safety and safety of the respective valuables, financial institutions being the utmost priority. The proposed device is reliable, inexpensive with a suitable layout. This undertaking High Protection Voice Identification based Bank Locker Security System with Live Image Authentication ensures to promote encouraging and improvised results, improving the safety and secureness over the presently present technologies.

### REFERENCES

- [1] Kumar, Ajay; Sood, Priyan; Gupta, Utkarsh, "Internet of Things (IoT) for Bank Locker Security System", (2020) 6th International Conference on Signal Processing and Communication (ICSC), 315–318. doi:10.1109/ICSC48311.2020.9182713
- [2] Chikara, Arvasu; Choudekar, Pallavi; Ruchira, ;Asija, Divya, "Smart Bank Locker Using Fingerprint Scanning and Image Processing", (2020) 6th International Conference on Advanced Computing and Communication Systems (ICACCS), (), 725–728. doi:10.1109/ICACCS48705.2020.9074482
- [3] Sandip Dutta1 Nitin Pandey2 Sunil Kumar Khatri, "Microcontroller Based Bank Locker Security System Using IRIS Scanner and Vein Scanner", Proceedings of the International Conference on Inventive Research in Computing Applications (ICIRCA 2018) IEEE Xplore Compliant Part Number:CFP18N67-ART; ISBN:978-1-5386-2456-2
- [4] Gusain, Raj; Jain, Hemant; Pratap, Shivendra, "Enhancing bank security system using Face Recognition, Iris Scanner and Palm Vein Technology", (2018). 3rd International Conference On Internet of Things: Smart Innovation and Usages (IoT-SIU) -, (), 1–5. doi:10.1109/IoT-SIU.2018.8519850
- [5] Z. M. TahmidulNirmol Deb NathUtshawRafinAkther "Six Tier Multipurpose Security Locker System Based on Arduino", 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT 2019)
- [6] Hossain, Shafayet; Ahmed, MazidIshtique; NiazMostakim, Md, "A Prototype of Automated Vault Locker Solution for Industrial Application", (2019) 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT), (), 1–6. doi:10.1109/ICASERT.2019.8934754



- [7] Kale, PriyankaHemant; Jajulwar, K. K. (2019). [IEEE 2019 9th International Conference on Emerging Trends in Engineering and Technology - Signal and Information Processing (ICETET-SIP-19) - Nagpur, India (2019.11.1-2019.11.2)] 2019 9th International Conference on Emerging Trends in Engineering and Technology - Signal and Information Processing (ICETET-SIP-19) - Design of Embedded Based Dual Identification ATM Card Security System. , (), 1–5. doi:10.1109/ICETET-SIP-1946815.2019.9092027
- [8] Fingershield ATM – ATM Security System using Fingerprint Authentication Christiawan1 , BayuAji Sahar2 , Azel Fayyad Rahardian3 , ElvayandriMughtar doi:10.1109/ISESD.2018.8605473
- [9] Swathi, H; Joshi, Suraj; Kiran Kumar, M.K. (2018). [IEEE 2018 Second International Conference on Advances in Electronics, Computers and Communications (ICAECC) - Bangalore, India (2018.2.9-2018.2.10)] 2018 Second International Conference on Advances in Electronics, Computers and Communications (ICAECC) - A Novel ATM Security System using a User Defined Personal Identification Number With the Aid of GSM Technology. , (), 1–5. doi:10.1109/ICAECC.2018.8479533
- [10] Embarak, Ossama H. (2018). [IEEE 2018 Fifth HCT Information Technology Trends (ITT) - Dubai, United Arab Emirates (2018.11.28-2018.11.29)] 2018 Fifth HCT Information Technology Trends (ITT) - A two-steps prevention model of ATM frauds communications. , (), 306–311. doi:10.1109/CTIT.2018.8649551



**INNO**  **SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 7.542**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
**INDIA**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



[www.ijircce.com](http://www.ijircce.com)

Scan to save the contact details