

Bank Locker Security System using Machine Learning

Yogesh Kumar, Vinay Dogra

Students, Department of Computer Science And Engineering
Dronacharya College of Engineering, Gurugram, Haryana, India.

Abstract: This project proposes a bank locker security system that employs machine learning techniques for face and liveness detection. The system uses a combination of computer vision and machine learning algorithms to identify the person accessing the locker and verify their identity. The system uses facial recognition technology to identify the user and then performs liveness detection to ensure that the user is physically present and not using a photograph or video. The proposed system provides enhanced security to the bank lockers by reducing the chances of unauthorized access. It is expected to be highly accurate and reliable, making it an ideal solution for banks and other financial institutions that need to ensure the safety of their customers' valuables. In face to face detection Convolutional Neural Networks(CNN) algorithm features plays important role .

Keywords: Face Recognition, Liveness Detection, Computer Vision, Privacy, User Verification, Authentication, Fraud Detection.

I. INTRODUCTION

The security of bank lockers is of utmost importance in the banking industry. The traditional method of securing bank lockers with keys and passwords has proven to be vulnerable to thefts and frauds. Hence, the use of advanced technologies such as machine learning and computer vision has become essential to enhance the security of bank lockers.

This project proposes a bank locker security system that employs machine learning techniques for face and liveness detection. The system uses facial recognition technology to identify the user and performs liveness detection to ensure that the user is physically present and not using a photograph or video. The proposed system aims to improve the security of bank lockers by reducing the chances of unauthorized access.

In recent years, the application of machine learning in the banking sector has increased tremendously due to its ability to provide accurate and reliable results. Machine learning algorithms can learn and adapt to new situations, making them an ideal choice for security applications. The proposed system uses a combination of computer vision and machine learning algorithms to identify the person accessing the locker and verify their identity.

Overall, the proposed bank locker security system using machine learning with face and liveness detection is expected to be highly accurate and reliable, making it an ideal solution for banks and other financial institutions that need to ensure the safety of their customers' valuables.

II. METHODS

Bank locker security is of utmost importance as it contains valuable assets and documents of customers. Machine learning can play a vital role in enhancing the security of bank lockers by incorporating face and liveness detection technology. Here's how:

1. **Face Detection:** A camera can be installed at the entrance of the locker room to detect faces of individuals. The face recognition system can be trained using machine learning algorithms to recognize authorized personnel and alert the security personnel in case of an unauthorized attempt.
2. **Liveness Detection:** Fraudsters can use 2D or 3D images of authorized personnel to gain access to bank lockers. Liveness detection technology can detect whether the face in front of the camera is live or not,

preventing fraudsters from using fake images.

3. Two-Factor Authentication: Two-factor authentication can be used to enhance security further. After successful face and liveness detection, the system can prompt the user to enter a unique code or use a biometric scan to confirm their identity.
4. Intruder Detection: The camera can be equipped with motion sensors to detect any suspicious activity in the locker room. The machine learning model can detect and raise an alarm in case of any movement or activity inside the locker room outside of business hours or unauthorized personnel.
5. Real-time Alerts: The system can be configured to send real-time alerts to the security personnel in case of any suspicious activity or unauthorized attempt to access the locker room.
6. Continuous Learning: The system can be trained using machine learning algorithms to continuously learn and improve the accuracy of face and liveness detection.

III. DISCUSSION

The Bank Locker Security System using Machine Learning with Face and Liveness Detection proposed in this project offers several advantages over traditional methods of securing bank lockers.

Firstly, the system uses advanced facial recognition technology that accurately identifies the user accessing the locker. Facial recognition has been proven to be a reliable technology in various applications, and its use in bank locker security systems can reduce the chances of fraudulent access.

Secondly, the system employs liveness detection to ensure that the user is physically present and not using a photograph or video to access the locker. This adds an additional layer of security to the system, making it harder for unauthorized individuals to gain access.

Thirdly, the system can continuously learn and adapt to new situations, making it more efficient and accurate over time. Machine learning algorithms can analyze data and identify patterns, which can be used to improve the accuracy of the facial recognition and liveness detection components of the system.

However, there are some potential drawbacks to using such a system. Firstly, there may be concerns over privacy and the storage of personal information such as facial recognition data. Secondly, there may be a risk of false positives or negatives, which could cause inconvenience to users. Therefore, it is crucial to implement proper data protection and user verification protocols to address these issues.

IV. CONCLUSION

In conclusion, the proposed Bank Locker Security System using Machine Learning with Face and Liveness Detection is a reliable and efficient solution for enhancing the security of bank lockers. The system uses facial recognition technology and liveness detection to accurately identify users and ensure that they are physically present, reducing the chances of unauthorized access.

The application of machine learning algorithms in the system enables it to continuously learn and adapt to new situations, making it more efficient and accurate over time. However, it is important to address potential concerns over privacy and user inconvenience by implementing proper data protection and user verification protocols.

Overall, the Bank Locker Security System using Machine Learning with Face and Liveness Detection has the potential to improve the security of bank lockers and provide customers with greater peace of mind. With further development and implementation, this system could become a vital component of bank security infrastructure.