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Face and Liveliness Detection Based Smart Bank Locker

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ABSTRACT: Ensuring the security of transactions is currently one of the biggest challenges facing banking systems. The use of biometric authentication of users attracts huge sums of money from banks around the world due to their convenience and acceptance. Especially in offline environments, where face images from ID documents are matched to digital selfies. In fact, comparisons of selfies with IDs have also been used in some broader programs these days, such as automatic immigration control. The great difficulty of such a process lies in limiting the differences between comparative facial images given their different origins. we propose a novel architecture for cross-domain matching problem based on deep features extracted by two well-referenced Convolutional Neural Networks(CNN) and neutral network . The results obtained from the data collected, called Face Bank, with more than 93% accuracy, indicate the strength of the proposed face-to-face comparison problem and its inclusion in real banking security systems.

KEYWORDS: Convolutional Neural Networks(CNN), neural network ,Face Bank, automatic immigration control, Digital selfies, Face-to-face comparison problem.

I. INTRODUCTION

Liveliness detection has been a very active research topic in fingerprint recognition and iris recognition communities in recent years. Liveliness is the act of differentiating the feature space into live and nonliving. Imposters will try to introduce a large number of spoofed biometrics into system. With the help of liveliness detection, the performance of a biometric system will improve. It is an important and challenging issue which determines the trustworthiness of biometric system security against spoofing. In face recognition, the usual attack methods may be classified into several categories. The idea of classifying is based on what verification proof is provide to face verification system, such as a stolen photo, stolen face photos, recorded video, 3D face models with the abilities of blinking and lip moving, 3D face models with various expressions and so on. The idea of classifying is based on what verification proof is provide to face verification system, such as a stolen photo, stolen face photos, recorded video, 3D face models with the abilities of blinking and lip moving, 3D face models with various expressions and so on. The idea of classifying is based on what verification proof is provide to face verification system, such as a stolen photo, stolen face photos, recorded video, 3D face models with the abilities of blinking and lip moving, 3D face models with various expressions and so on. In this paper, we proposed a method of live face detection to resist the attack using a photograph. Our algorithm is based on analysis of movement of facial components, especially eyes, in sequential images. Generally in sequential face images there are very little variations in shape of face and facial components. So we detect eyes in sequential face images and compare the shape of each eye region decide whether the input face image is a real face or a photograph.

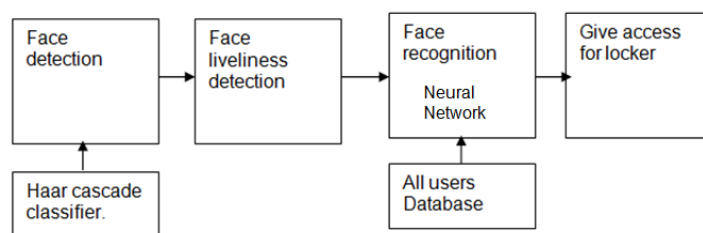
II. LITERATURE REVIEW

Gang Pan et al.[1] present a spoofing against photograph in face recognition using real time liveness detection using spontaneous eye blinking. This method requires only a generic camera no other hardware to avoid spoofing attack in nonintrusive manner. Eye blinking is physical process which instantaneously opens and closes lids many times in a minute. Generic camera captures 15 frames per seconds, it gives two frames of faces which used as clue against spoofing attack. Two captured frames in sequence are considered as independent. HMM produces features from finite state set. Typical eye blink activity using HMM feature finds spoofing attack. Anjos et al.[2] proposed a method based on foreground or background motion correlation for checking liveness of user. This method classified in motion detection. This method works on correlation between head rotation of user and its background. To find correlation author uses fine grained motion direction. Optical flow is used to find the direction of motion. This approach is easy process but require multiple frames to check liveness, so user should be co-operative. Face liveness detection [3] has been proposed to improve the reliability and security of face recognition system. The fake faces are distinguished from the real ones using different classification techniques. In this paper, we propose a single image-based fake face detection method based on frequency and texture analyses for discriminating 2-D paper masks from the live faces. For the frequency analysis, we have carried out power spectrum based method [4] which exploits not only the low frequency information but also the information residing in the high frequency regions. Moreover, widely used Local Binary Pattern (LBP) [5]. In face recognition, the usual attack methods may be classified into several categories. The idea of classifying is based on what verification proof is provide to face verification system, such as a stolen photo, stolen face photos, recorded video, 3D face models with the abilities of blinking and lip moving, 3D face models with various expressions and so on [6]

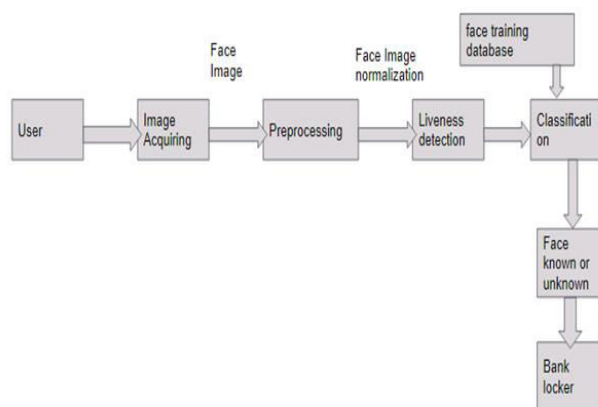
III. METHODOLOGY

The general public has immense need for security measures against spoof attack. Biometrics is the fastest growing segment of such security industry. The face recognition can be used for bank locker security but it can be easily hacked if somebody uses photograph of person, so there is need for liveness detection along with face Recognition

The proposed framework that combines Face Net with liveness detection is shown in Figure 1



In above block diagram we are going to detect face using haar cascade classifier which algorithm for detection of face. After detection of face, system will decide the face is real or fake by using liveness detection technique. Liveness detection technique is the act of differentiating the feature space into live and non-living. In this system we need a way to detect faces and eyes in real-time. So we are using -cascade classifier to perform these tasks. In this haar cascade classifier Cascade is a machine learning object detection algorithm used to identify objects in an image or video. For face detection module, a three-layer feed forward artificial neural network with Tanh activation function is proposed that combines AdaBoost to detect human faces so that face detecting rate is rather high. For face alignment module, a multilayer perceptron (MLP) with linear function (three-layer) is proposed, and it creates 2D local texture model for the active shape model (ASM) local searching



In this diagram we are going to implement eye-blink detection & face recognition Based on LBPH algorithm and neural network . The algorithm works in real time through a webcam and displays the person's name. The program runs as follows:

- [1] .Detect faces in each frame generated by the webcam.
- [2] For each detected face, detect eyes.
- [3] Detect liveness of the face i.e. eyes are blinking or not
- [4] Recognize face and access the respected locker of the user

IV .EXPERIMENTAL RESULTS

The general public has immense need for security measures against spoof attack. Biometrics is the fastest growing segment of such security industry. Some of the familiar techniques for identification are facial recognition, fingerprint recognition, handwriting verification, hand geometry, retinal and iris scanner. Among these techniques, the one which has developed rapidly in recent years is face recognition technology. In general, face recognition algorithms are not able to differentiate live face from not live face which is a major security issue. It is an easy way to spoof face recognition systems by facial pictures such as portrait photograph. In order to guard against such spoofing, a secure system needs liveness detection.

V. CONCLUSION

In this paper provide a simple path for development of novel and more secured face liveness detection approach for bank locker security.

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