PEHCHAN E-LEARNING: Engineering College Prospective

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I. Abstract

In the last few years face recognition has received a lot of attention. Recently face authentication has become very popular since it is easy to use and face recognition technologies have achieved good performance. Face biometric systems are widely used for recognizing the true identity of enrolled person on the basis of physiological appearances and behavioral patterns. However, this can be spoofed by nefarious users trying purposely to by- pass face recognition on system using various traits like photo or video of the person held in front of the camera may be accountable for performing face recognition. Using anti-face spoofing methods in our facial recognition framework, we tried to detect "real" or "fake" faces. By detecting possible spoofing attacks like placing 3D printed photo, eye & mouth photo imposter and video of a person in front of the camera, the proposed method improves liveness accuracy results.

Keywords: Liveness Detection, Face Spoofing Detection, Anti-face spoofing

II. Introduction

The main objective of our proposed work was to distinguish between "Actual" and "Non Real" faces by using anti-face spoofing algorithms. We have used Convolution Neural Network algorithm which is widely used for image processing work and implemented in the application using python programming with OpenCV, Keras and TensorFlow framework. We have studied various existing systems which generally involve image capture of users from the camera, Face detection, Feature Extraction, Matching features stored in the database and finally determine identity if there is a match or not. The problem with these systems is they are prone to the spoofing attacks. Facial data used in biometrics can easily be stolen from social platforms or online communities and used for device spoofing. Playing video or placing a 3D dummy mask of the user in front of the camera may also be used to spoof the user's face. Integrated liveness detection may be used to solve certain problems where physiological signs of life are present in the database. For a given image input, we trained a CNN for distinguishing real faces from unreal faces.

III. LITERATURE SURVEY

Face Liveness detection is the term used to refer if the face has features of motion, texture and life signs. Liveness detection is a process to determine whether a detected face is real or not before a face recognition system identifies the face. It prevents the face recognition system from making a wrong decision. There are several types of spoofing faces, such as 2D printed photos, videos, high-definition (HD) tablets, 3D masks, and so on. Among them, 2D photos are used widely because they are easy and cheap to obtain. To minimize the vulnerability against 2D attacks, researchers have shown steady progress in developing anti- spoofing technologies based on features of 2D photos**.**

There are some characteristics in recaptured 2D photos. First, detailed components and sharpness are lost. In this case, researchers analyze texture and frequency components in the input data. In order to represent the textural feature, local binary patterns (LBP) are often used over face regions and using an SVM to classify the faces as real or spoofed, calculate secularity components from the input data there are a number of approaches to liveness detection which includes & suggest a counter measure with the fusion of motion and micro- texture analysis methods. The last approach is based on 3D facial information. Based on type of liveness indicator face liveness detection can be separated into three main categories i.e.

(a)   Motion
Analysis
(b)   Texture
Analysis
(c)   Life   Sign
Detection

present a real-time solution using a thermal image and skin elasticity of a human face.

Most researchers utilized eyeblink as it is an essential function of eyes. For effective and more reliable face liveness detection combined biometric traits could be utilized instead of system based on capturing only eyeblink**.** Convolutional neural networks are specifically designed to work with problems involving images as inputs. CNNs can be used to solve machine learning or data mining problems wherein inputs can be represented by an image or a set of images. CNNs can be visualized as a modified version of multi-perceptron neural network model.

IV. PROBLEM STATEMENT AND OBJECTIVE

1.   Problem Statement

According to the previous attendance management system, the accuracy of the data collected is the biggest issue. This is because the attendance might not be recorded personally by the original person, in another word, the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data. For example, student A is lazy to attend a particular class, so student B helped him/her to sign

for the attendance which in fact student A didn't attend the class, but the system overlooked this matter due to no enforcement practiced. Supposing the institution establish an enforcement, it might need to waste a lot of human resource and time which in turn will not be practical at all. Thus, all the recorded attendance in the previous system is not reliable for analysis usage. The second problem of the previous system is where it is too time consuming. Assuming the time taken for a student to sign his/her attendance on a 3-4 paged name list is approximately 1 minute. In 1 hour, only approximately 60 students can sign their attendance which is obviously inefficient and time consuming. The third issue is with the accessibility of those information by the legitimate concerned party. For an example, most of the parents are very concerned to track their child's actual whereabouts to ensure their kid really attend the classes in college/school. However, in the previous system, there are no ways for the parents to access such information.

Therefore, evolution is needed to be done to the previous system to improve efficiency, data accuracy and provides accessibility to the information for those legitimate party.

2. Objectives

The proposed system will reduce the paperwork where attendance will no longer involve any manual recording. The new system will also reduce the total time needed to do attendance recording. The new system will acquire individual attendance by means of facial recognition to secure data accuracy of the attendance.

The following are objectives of the project:
- ✓ To develop a portable Smart Attendance System which is handy and self-powered.
- ✓ To ensure the speed of the attendance recording process is faster than the previous system which can go as fast as approximately 3 second for each student.
- ✓ To detect unique faces with the help of computer's camera
- ✓ Able to recognize the face of an individual accurately based on the face database.
- ✓ Allow parents to track their child's attendance.
- ✓ Develop a database for the attendance management system.
- ✓ Provide a user-friendly interface for admins to access the attendance database and for non-admins (parents) to check their child's attendance by mailing the attendance.
- ✓ Allow new students or to store their faces in the database by using a GUI
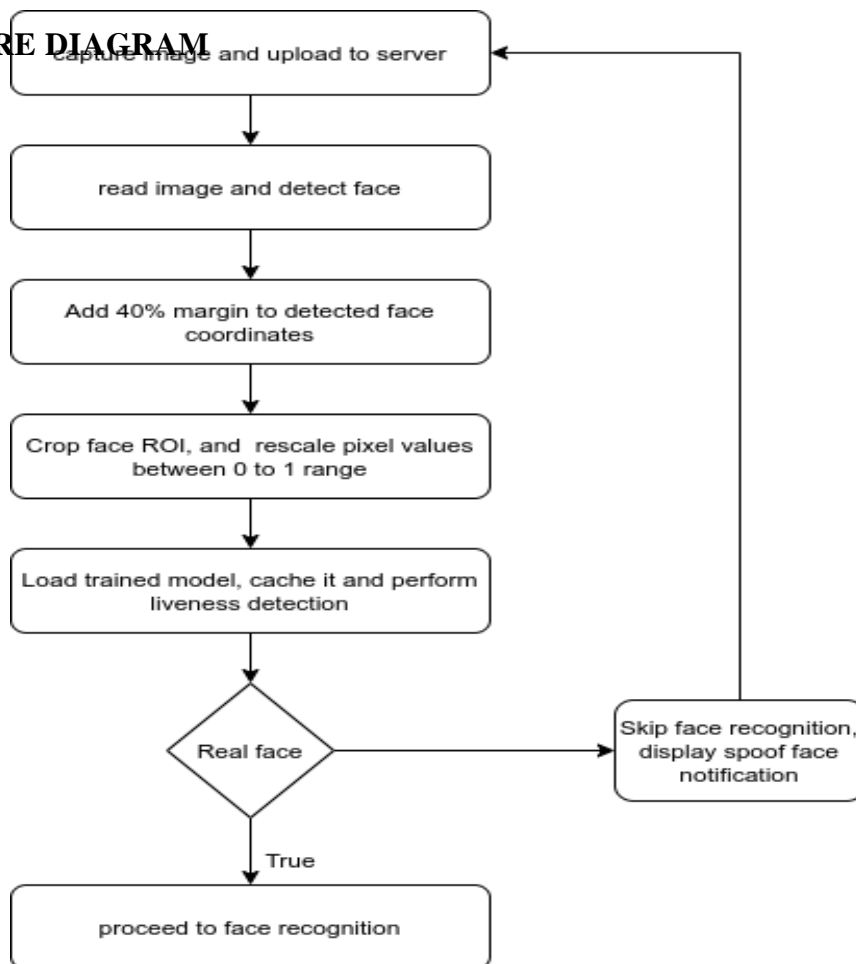
V. PROPOSED SYSTEM

To use Multiple Face Recognition and Liveness Detection using CNN, the face must be detected. The camera must be placed in the way that person's face appears clear enough. Then it is frame by frame analyzed to detect the face and recognized by the face recognition module. Finally, it checked for liveness detection.

CNN in Multiple Face Recognition and Liveness Detection involves three modules:
- ✓ Multiple Face Detection
- ✓ Face Recognition
- ✓ Liveness Detection

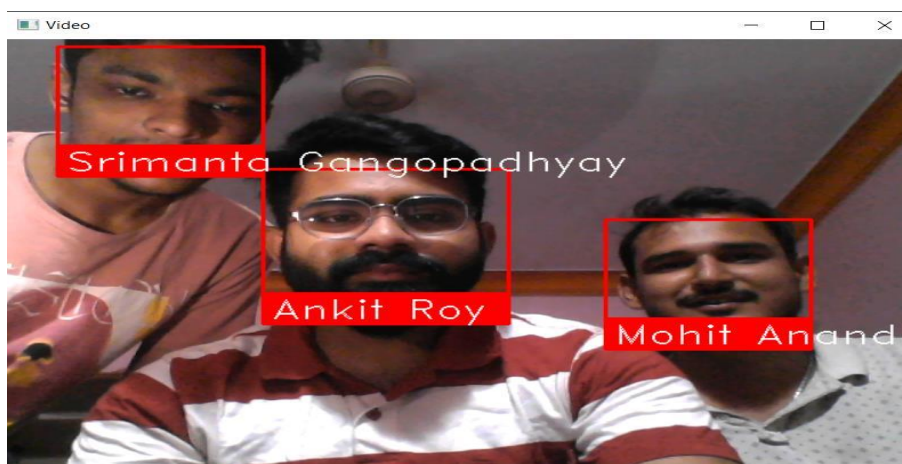# I.   ARCHITECTURE DIAGRAM

VII.   INPUT & OUTPUT

Home Page

1	Registration No.	Name	Branch	Semester	Time	Last Seen
2						
3	1801298364	Srimanta Gangopadhyay	CSE	8th	19:15:57	19:15:57
4	1801298043	Ankit Roy	CSE	8th	19:15:58	19:15:58
5	1921298030	Mohit Anand	CSE	8th	19:16:01	19:16:01
6						
7						

Marked
Attendance

VIII. CONCLUSION

We studied methods of spoofing face recognition used for authorization, with a focus on photo and video spoofing. Owing to the lack of normalization or self-quotient picture such as back tilting, slanted images and rotations, the hamming distance seems to tolerate further spoofs in these situations, resulting in a higher number of false positives.

Other problems that have been observed are variation of brightness or electronic noise on images may costs the texture information. Eye glasses may cause reflection. In the proposed project we have used several liveness indicators which considerably improves the reliability of face recognition system and guard against spoofing.

The accuracy in Liveness detection may further help to develop models for detecting the emotions on faces. Our main aim is to provide a straightforward roadmap for the potential creation of more reliable, user-friendly, and effective methods for detecting face liveness.

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