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Survey on Face Recognition Based Attendance Management System Using HOG Feature Extraction and SVM Classifier

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Abstract: ***Face recognition system plays a vital role in almost every sector in this digital era. Face recognition is one of the popular biometrics' techniques. It can used for security, authentication, identification and so on. It having low accuracy when compared to iris recognition and fingerprint recognition, but it is being widely used due to its contactless process. Face recognition technique can also be used for attendance marking field. This system targets to building a class attendance system which is used the technique of face recognition. We all know existing manual attendance system is taking more time and difficult to maintain. And having chances of proxy in attendance. That's why, the need for this system occurs. This system consists of four phases- registration module, database creation, face detection, face recognition, attendance updating, attendance sending. Database consist of the image of the students in class. Face detection and recognition is performed using HOG feature extraction and SVM (Support Vector Machine) classifier. Faces will be detected and recognized from video streaming of the classroom. Attendance will be mailed to the respective faculty at the end of the lectures.***
Keywords: Face Recognition; Face Detection; SVM classifier; HOG feature extraction; attendance system;

I. INTRODUCTION

Traditional method of attendance marking is a hectic job in many institutions. It is also an extra task to the employee who must mark attendance by calling the names of students manually which may take minimum 5 minutes of whole session. This is time taking. There are some possibilities of proxy in attendance. That's why, many institutes using many other techniques for taking attendance such as Radio Frequency Identification (RFID), iris scanner, fingerprint recognition, and list goes on. Face recognition has placed an very important biometric feature, which can be easily acquirable. Face recognition-based systems are relatively insensible to lots of facial expression.

Face recognition system consists of two categories: verification and face identification. Face verification is a 1:1 matching process, it compares face image against the template face images and whereas is an 1:1 problems that compares a single face image. The purpose of this system is to build a attendance system which is based on face recognition techniques. Here face of an individual will be used for marking attendance.

Nowadays, face recognition is getting more popularity and has been widely used. In this paper, we proposed a system which finds the face of students from live streaming video and attendance will be marked if the detected face is found in the database. This new system will takes less time than compared to old methods.

II. LITERATURE REVIEW

A. Automated Attendance System Using Face Recognition

Akshara Jadhav done the work on the automatic face recognition system by using Viola-Jones algorithm for face detection. In this algorithm face was detected by cascade classifier and PCA algorithm. They explained the various algorithm and choose the best one like Viola- Jones for their project work which makes internal image and AdaBoost imaging as classifier.

B. Face Recognition based smart attendance system using IOT

In this paper they have carried work on the smart attendance system which they used face recognition library for the face detection and storage of attendance on the system. Along with they designed the method which automatically sends the absent message to their parents. In their work they used OpencCv library for the source of vision library. Their main components for output are Raspberry Pi – 3 and SM protocol.

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C. Face Recognition System

In this literature work carried out by using KLT algorithm and Voila-Jones algorithm for face detection. This algorithm has operated on the Haar classifer which continuously allows to detect the faces of the students. Proposed work compared with various face detection algorithm but KLT algorithm they used in this method is better than all the methods because of accuracy in the recognition. PCA is also better tool for detection they used which enhances the performance of KLT and Voila – Jones algorithm.

D. Facial Recognition Attendance System Using Python and OpenCv

According to this research journal of Dr V Suresh done the research on the facial recognition attendance system using programming languages and library. The programming language they used is Python and open source of library is OpenCv. They created the face database which pump into the algorithm which uses the data during face recognition and gives the output into the excel sheet. They used Numpy package for fast math calculation for the algorithm. Camera first captures the faces and it stored on the library with their ID number. Then detection will be occurred by image acquisition and pre-processing procedure followed by hierarchy manner of face database.

E. Face Recognition based Attendance Management System

This is the fifth research paper for literature on the face recognition-based attendance management system by Smitha. In this research paper they used the four phases for face detection - database creation, face detection, face recognition and updation of the recognised face on the attendance. Authors are used the Haar - cascade classifier algorithm for the face recognition and detection. They designed the system which can detect the face on the start of the lecture and during the lectures. Ones the images are captured they automatically crop and compare with the database and marked the attendance.

III. SUMMARY

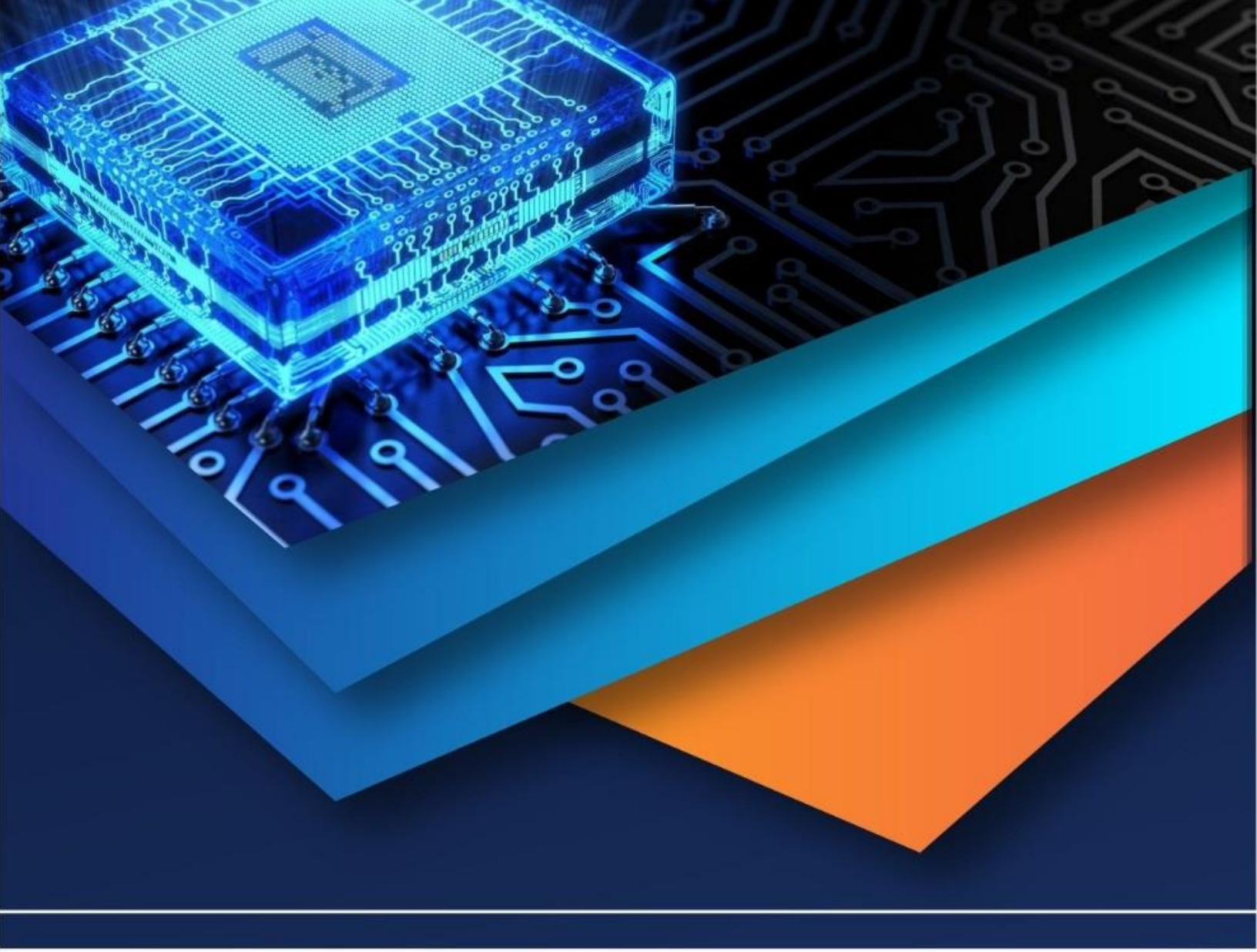
Face recognition attendance is the new management system comes in the digital years which are boon to the system. These systems are replacing the traditional attendance system which reduces the time and complexity during the attendance in the collage. This automatically reduces the burden on the professor and they can give the more time to explain the subjects. All management systems are used KLN algorithm, Voila- Jones Algorithm for face recognition. Data stored on the library is used to mark the attendance by face recognition. It provides easy access to all the collages and gives the attendance number easily. We used the HOG feature extraction and SVM classifier.

IV. CONCLUSION

Now a day's world is going towards automation, so by keeping in mind we introduced this concept of attendance management system by face recognition. This project gives the automatic attendance of the students and directly sends it to respective faculty. We used the HOG feature extraction and SVM classifier allows others for further new innovation and changes in the hardware. This system removes the flaws in the attendance system and reduces the human intervention. Project is designed so accurately which takes attendance automatically helps the institutions for data management.

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