

GALGOTIAS UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



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ATTANDANCE SYSTEM WITH FACE RECOGNITION

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ATTENDANCE SYSTEM WITH FACE RECOGNITION

INTRODUCTION

Face recognition is an important application of Image processing owing to its use in many fields. Identification of individuals in an organization for the purpose of attendance is one such application of face recognition.

Maintenance and monitoring of attendance records plays a vital role in the analysis of performance of any organization. The purpose of developing attendance management system is to computerize the traditional way of taking attendance. Automated Attendance Management System performs the daily activities of attendance marking and analysis with reduced human intervention. The prevalent techniques and methodologies for detecting and recognizing face fail to overcome issues such as scaling, pose, illumination, variations, rotation, and occlusions. The proposed system aims to overcome the pitfalls of the existing systems and provides features such as detection of faces, extraction of the features, detection of extracted features, and analysis of students' attendance. The system integrates techniques such as image contrasts, integral images, color features and cascading classifier for feature detection. The system provides an increased accuracy due to use of a large number of features (Shape, Colour, LBP, wavelet, Auto-Correlation) of the face. Faces are recognized using Euclidean distance and k-nearest neighbor algorithms. Better accuracy is attained in results as the system takes into account the changes that occur in the face over the period of time and employs suitable learning algorithms.

The system is tested for various use cases. We consider a specific area such as classroom attendance for the purpose of testing the accuracy of the system. The metric considered is the percentage of the recognized faces per total number of tested faces of the same person. The system is tested under varying lighting conditions, various facial expressions, presence of partial faces (in densely populated classrooms) and presence or absence of beard and spectacles. An increased accuracy (nearly 100%) is obtained in most of the cases considered.

OBJECTIVES

- Detection of unique face image amidst the other natural components such as walls, backgrounds etc.
- Extraction of unique characteristic features of a face useful for face recognition.
- Detection of faces amongst other face characters such as beard, spectacles etc.
- Automated update in the database without human intervention.

ABSTRACT

With advances in computing and telecommunications technologies, digital images and video are playing key roles in the present information era. Human face is an important biometric object in image and video databases of surveillance systems. Detecting and locating human faces and facial features in an image or image sequence are important tasks in dynamic environments, such as videos, where noise conditions, illuminations, locations of subjects and pose can vary significantly from frame to frame. An automated system for human face recognition in real time background for a college to mark the attendance of their employees and students. So Smart Attendance using Real Time Face Recognition is a real world solution which comes with day to day activities of handling employees. Here multiple user faces are detected and recognised with the data base trained multiple texture based features.

EXISTING METHOD

- Finger print based automation
- Iris based recognition.

DRAWBACKS

- Process will be in Q basis

PROPOSED METHOD

- Class room automation with multi face feature comparison and recognition system.
- Feature Extraction
- Neural Networks

LBP FEATURE EXTRACTION

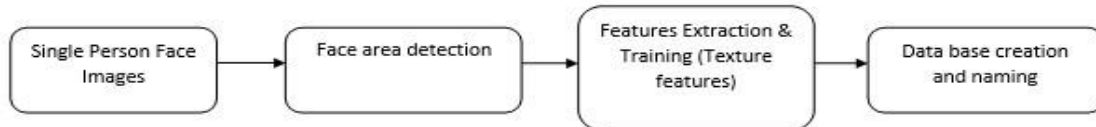
LBP is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. Due to its discriminative power and computational simplicity, LBP texture operator has become a popular approach in various applications. It can be seen as a unifying approach to the traditionally divergent statistical and structural models of texture analysis. Perhaps the most important property of the LBP operator in real-world applications is its robustness to monotonic gray-scale changes caused, for example, by illumination variations. Another important property is its computational simplicity, which makes it possible to analyze images in challenging real-time settings.

NEURAL NETWORKS

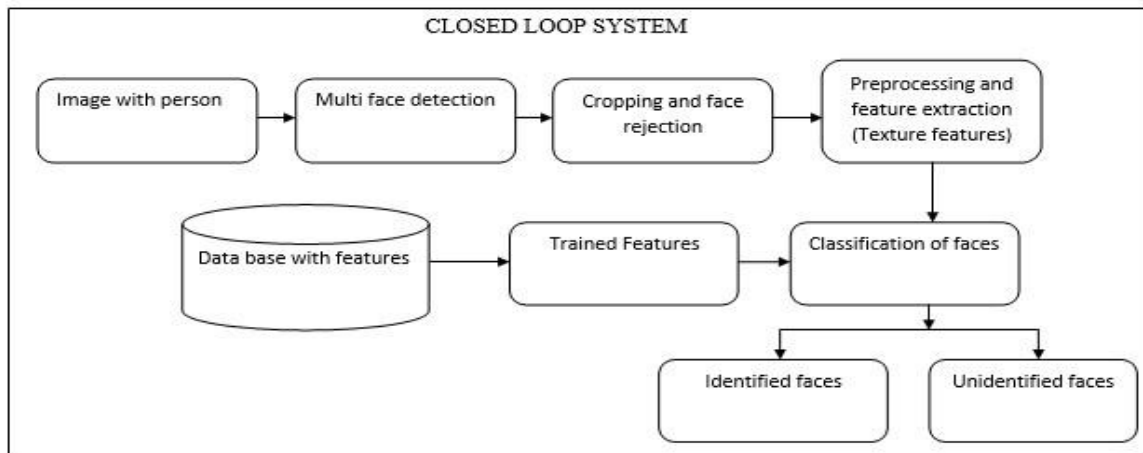
ANN is the term on the method to solve problems by simulating neuron's activities. In detail, ANNs can be most adequately characterized as "computational models" with particular properties such as the ability to adapt or learn, to generalize, or to cluster or organize data, and which operation is based on parallel processing. However, many of the previously mentioned properties can be attributed to nonneural models. A hybrid approach combining AdaBoost and ANN is proposed to detect faces with the purpose of decreasing the performance time but still achieving the desired faces detecting rate. The selected neural network here is three-layer feedforward neural network with back propagation algorithm. The number of input neurons is equivalent to the length of extracted feature vector, and the number of output neurons is just 1 (), This will return true if the image contains a human face and false if it does not. The number of hidden neurons will be selected based on the experiment; it Depends on the sample database set of images.

BLOCK DIAGRAM

**BY USING LBP BASED FEATURE EXTRACTION
DATABASE CREATION**



ATTENDANCE MARKING SYSTEM:



ADVANTAGES

- Automatized recognition and replication system.
- The software stores the faces that are detected and automatically marks attendance.
- It saves their time and efforts.
- The system is convenient and secure for the users.

DISADVANTAGES

- The system don't recognize properly in poor light so may give false results.
- It can only detect face from a limited distance.

APPLICATIONS

- High efficient signal transfer systems.
- The system can be used for places that require security like bank, military etc.
- It can also be used in houses and society to recognize the outsiders and save their identity.
- The software can used to mark attendance based on face recognition in organizations.

SOFTWARE REQUIREMENTS

- Python
- Opencv
- Numpy

RESULT

Thus the attendance are recorded in the database by the comparison with the image present in the image enrolment database by the use of neural networks.

CONCLUSION:

There may be various types of lighting conditions, seating arrangements and environments in various classrooms. Most of these conditions have been tested on the system and system has shown 100% accuracy for most of the cases. There may also exist students portraying various facial expressions, varying hair styles, beard, spectacles etc. All of these cases are considered and tested to obtain a high level of accuracy and efficiency. Thus, it can be concluded from the above discussion that a reliable, secure, fast and an efficient system has been developed replacing a manual and unreliable system. This system can be implemented for better results regarding the management of attendance and leaves. The system will save time, reduce the amount of work the administration has to do and will replace the stationery material with electronic apparatus and reduces the amount of human resource required for the purpose. Hence a system with expected results has been developed but there is still some room for improvement.

SCOPE FOR FUTURE WORK:

- Currently, the system has reached the accuracy level up to 80% for partial and dense images. It can further be improved to obtain higher accuracy levels.
- Further, 2 or more IP cameras can be employed and each image can be processed separately. The results of these can be merged to obtain better results and accuracy in denser classrooms.