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FACE RECOGNITION BASED STUDENT ATTENDANCE SYSTEM

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Abstract: In today's era of technology aided world, image processing is gaining immense importance towards digital world. Now a days, the field of image processing has wide range applications in biometric recognition, behavioural analysis, teleconferencing and video surveillance. This paper typically puts forward idea of using image processing techniques such as detection and recognition of faces to design the system that can automatically handle the attendance of the students. Various factors that act as challenges in face recognition are illumination, orientation, size, clarity, expression and intensity of facial images. With the help of training dataset, system is trained to detect the figures representing faces (positive images) and distinguish it from background (negative images) environment. The aim is to develop the automated system for detection and recognition of faces using their images from videos and recording the attendance of the students by identifying him/her from their variant facial features. This helps to maintain and handle the attendance system automatically without any human intervention. This new system can ease the hectic attendance maintenance and handling the attendance will be more precise and efficient.

I.INTRODUCTION

Facial image has set out to be an important biometric feature, which easily is acquirable and doesn't require any special or physical interaction between the subject and the device. As it is observed, image recognition is very complex and challenging one affecting variety of parameters such as intensity, orientation, expression and size.Individual recognition is of most importance in today's world due to varied reasons. Real-time applications of this algorithms faces some limitations to resolve loss of important information. Detection and recognition of faces in videos using image processing is discussed in. Various steps for detection and recognition are demonstrated and details regarding what algorithms are used to implement this techniques are described. Face detection methods can be classified based on the individuals face appearance, facial geometric structure, face colour etc. Some of the image processing techniques uses extraction of depth features to detect faces with respect to geometric variations and textures. Mapping of edges and skin colour thresholding is used to

detect faces in Viola- Jones. This new system can ease the hectic attendance maintenance and handling the attendance will be more precise and efficient. It works with human face detection with the help of Viola Jones algorithm and face recognition with LBPH algorithm and achieves accuracy of 95%. We train the dataset by giving the images of the students and the algorithm itself takes images of the students. Students will first register themselves in the system with proper details, and facial images captured from different angles and positions. On successful completion of registration process, store student's data in the database. Video Acquisition is done by capturing the video of the class being

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conducted in a classroom. The main concept behind the project is to develop the automated system for detection and recognition of faces using their images from videos and recording the attendance of the students by identifying him/her from their variant facial features. This helps to maintain and handle the attendance system automatically without any human intervention. This new system can ease the hectic attendance maintenance and handling the attendance will be more precise and efficient. The proposed system contributes to human face detection with the help of Viola Jones algorithm and face recognition with LBPH algorithm. Existing System: Face recognition is a part of pattern recognition. In early 1990s, Fisher faces and Eigen faces were proposed by. Fisher faces has better performance than Eigenfaces. Belhumeur, Hespanha, Kriegman presents Eigen and Fisher face as face recognition methodology based on the features. This feature based methods helps to achieve stability towards lighting conditions and poses variations with use of non-linear feature spaces. Proposed System: The proposed system aims to develop an automated attendance system using viola-jones algorithm for face detection and LBPH algorithm for face recognition. To achieve the project objective, firstly, video segments are captured of the classroom lecture. Pre – Processing of video is done to remove unwanted artifacts i.e. noise and other invariants. The next stage demonstrates detection of faces from the complex backgrounds and recognition of human being. This system helps to identify students to track his/her presence in the lecture and to avoid proxy attendance caused by unauthorized students. There are five stages of operation to develop the system, they are: Video acquisition, detection of faces, cropping, extraction of features and recognition of face.

II. LITERATURE REVIEW

Title: “An Analysis of the Viola-Jones Face Detection Algorithm, Image Processing” Author: Yi-Qing Wang Description: Viola-Jones algorithm, the first ever real-time face detection system. There are three ingredients working in concert to enable a fast and accurate detection: the integral image for feature computation, Adaboost for feature selection and an attentional cascade for efficient computational resource allocation. Here we propose a complete algorithmic description, a learning code and a learned face detector that can be applied to any color image. Title: “Rapid object detection using a boosted cascade of simple features” Author: P. Viola and M. Jones Description: The first is the introduction of a new image representation called the "integral image" which allows the features used by our detector to be computed very quickly. The second is a learning algorithm, based on AdaBoost, which selects a small number of critical visual features from a larger set and yields extremely efficient classifiers. The third contribution is a method for combining increasingly more complex classifiers in a "cascade" which allows background regions of the image to be quickly discarded while spending more computation on promising object-like regions. Title: “Face Detection by Using OpenCV’s Viola-Jones Algorithm based on coding eyes” Author: Abdul Mohsen Abdul Hossen Description: Facial identification is one of the biometrical approaches implemented for identifying any facial image with the use of the basic properties of that face. In this paper we proposes a new improved approach for face detection based on coding eyes by using Open CV's Viola-Jones algorithm which removes the falsely detected faces depending on coding eyes. Title: “Face recognition using Fisherface

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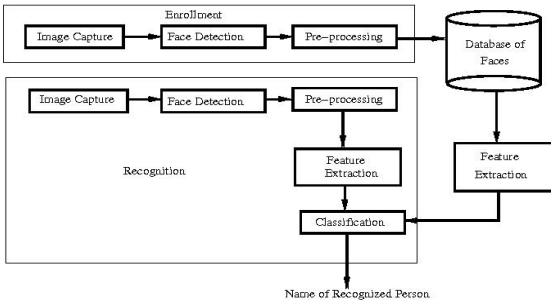
algorithm" Author: Hyung-Ji Lee Description: the Fisherface algorithm as a class-specific method is robust about variations such as lighting direction and facial expression. In the proposed face recognition adopting the above two methods, the linear projection per node of an image graph reduces the dimensionality of labeled graph vector and provides a feature space to be used effectively for the classification. Title: "Face recognition using Eigenfaces"Author: M.E. Gaikwad Description: Face is a complex multidimensional visual model and developing a computational model for face recognition is difficult. The goal is to implement the system (model) for a particular face and distinguish it from a large number of stored faces with some real-time variations as well. The Eigenface approach uses Fisher Face Algorithm (FFA) algorithm for the recognition of the images. It gives us efficient way to find the lower dimensional space.

III. IMPLEMENTATION

Architecture



Modules

Enrollment: The Enrolment module allows students to enroll in the system by providing their Rollo, Name, and a facial image. The faculty can then use a machine learning algorithm to train the system to recognize the enrolled student's face.

Recognition: The Recognition module is used to mark attendance for a particular subject. The faculty can enter the subject name and start the camera or attendance system. Students then need to present themselves in front of the camera, which uses the LBPH machine learning algorithm to recognize their faces from the trained facial images.

Attendance: Finally, the Attendance module generates an Excel sheet for the faculty that includes columns for Enrollment No, Name, Date, and Time, presenting the attendance records for the recognized students.

Algorithm: The Viola-Jones algorithm is a machine learning algorithm that uses a combination of Haar-like features and AdaBoost to detect faces in images. Once the faces are detected, they can be processed further using other algorithms, such as LBPH, for recognition.

On the other hand, LBPH (Local Binary Patterns Histograms) is a machine learning algorithm that uses a local texture-based approach to recognize faces. It works by extracting features from the facial image,

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creating a histogram of those features, and then comparing them to the histograms of known faces to determine a match. Together, Viola-Jones and LBPH can provide a more accurate and robust face recognition system than using either algorithm alone.

IV. OUTPUT

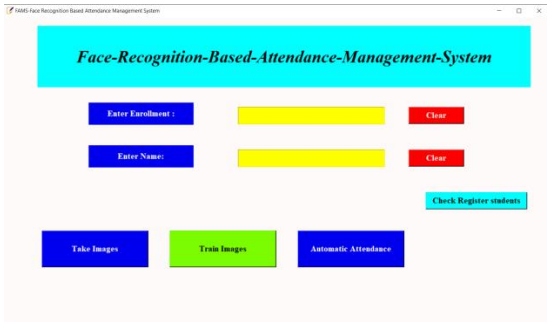

Fig:-3.1: Home page

Fig:- 3.2: Student Enrolment

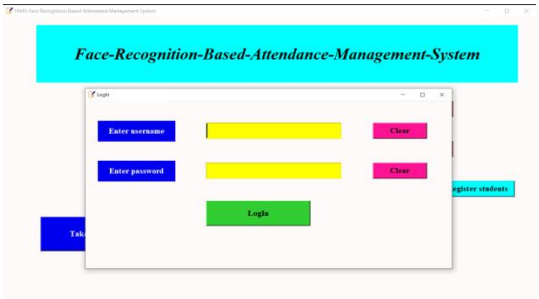

Fig:-3.4: Faculty Login Page

Fig3.5: Enrolled student Pages

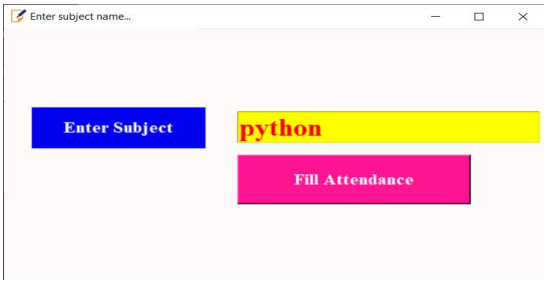

Fig-3.6: Subject Entering Page to Fill Attendance

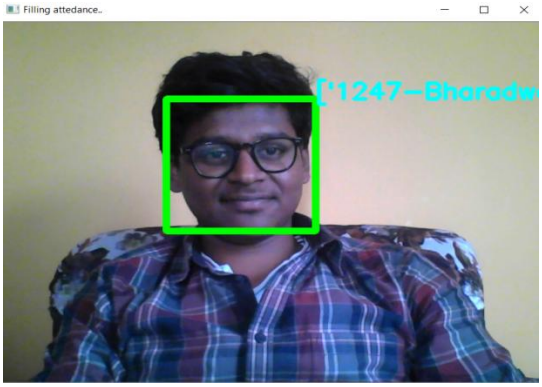

Fig:-7.7: Automatic Attendance

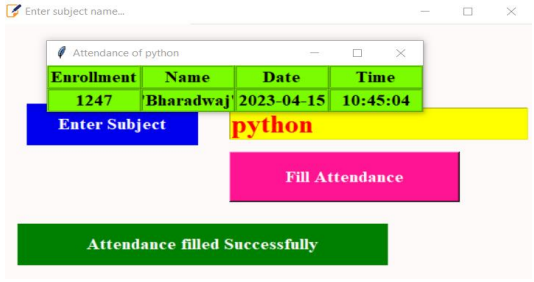

Fig: 7.8: Students Present in the Class

V.CONCLUSION

This system has been designed to automate the attendance maintenance. The main objective behind developing this system is

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to eradicate all the drawbacks and unconventional methods of manual attendance handling. The traditional methods lag the effectiveness of the system leading the time and paper wastage, and causes proxy attendance which is eliminated in automated system. So to overcome all such drawbacks of manual attendance, this framework would come out to be better and reliable solution with respect to both time and security. In this way, automated attendance system helps to distinguish between the faces in classroom and recognize the faces accurately to mark their attendance. The efficiency of the system can be improvised by fine tasking of the training process.

REFERENCES

1. S. V. Tathe, A. S. Narote, S. P. Narote, Human Face Detection and Recognition in Videos, International Conference on Advances in Computing, Communications and Informatics (ICACCI), Sept 2016, 21-24, Jaipur, India.
2. Hemdan, S. Karungaru, K. Terada, "Facial features based method for human tracking", 17th Korea-Japan Joint Workshop on Frontiers of Computer Vision, pp. 1 4, 2011.
3. R. Sarkar, S. Bakshi, P. K. Sa, "A real-time model for multiple human face tracking from low-resolution surveillance videos", Procedia Technology, vol. 6, pp. 1004-1010, 2012.
4. Yi-Qing Wang, An Analysis of the Viola-Jones Face Detection Algorithm, Image Processing On Line, 4 (2014), pp.128-148.
5. P. Viola and M. Jones, Rapid object detection using a boosted cascade of simple features, Proceedings of the 2001 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, vol. 1, 2001, pp.511 518.
6. P.Viola and M.Jones, Robust real-time face detection, International Journal of Computer Vision, vol. 57, pp.137-154, May 2004.
7. M. A. Turk, A. P. Pentland, "Face recognition using eigenfaces", IEEE Computer Society Conference on Computer Vision and Pattern Recognition, pp. 586 591, 1991.
8. Xiaoyang Tan and Bill Triggs, "Enhanced Local Texture Feature Sets for Face Recognition Under Difficult Lighting Conditions", IEEE Trans, on Image Processing, Vol. 19, No.6, June 2010.
9. Belhumeur, P., Hespanha, J., &Kriegman, D. (1997). Eigenfaces vs. Fisherfaces: Recognition Using Class Specific Linear Projection. IEEE Transactions on Pattern Analysis and Machine Intelligence, 19(7).
10. Liu, K.; Cheng, Y.-Q. & Yang, J.-Y. (1993) Algebraic feature extraction for image recognition based on an optimal discriminant criterion. Pattern Recognition, Vol.26, No.6, 903-906.