



International Journal of Advance Engineering and Research Development

Special Issue on Recent Trends in Data Engineering

Volume 4, Special Issue 5, Dec.-2017

Attendance Monitoring System Using Image Processing and Machine Learning

Kirtiraj Kadam, Manasi Jadhav, Shivam Mulay, Tushar Indalkar

Department of Computer Engineering, AISSMS Institute of Information technology, Pune,

Abstract —Attendance Monitoring is used in various fields like educational institutes, IT companies, Government offices etc. Educational institute require attendance for scholarships and various other important reasons, therefore attendance is marked manually or by roll call list but these methods can induce proxies or fake attendance of students who aren't present. This would prove injustice to the students who attend their colleges regularly. Hence the solution is to monitor the attendance in such a way that fake attendance is not marked and solution to this problem is by developing such a system that would mark attendance only of those students who are present in the classroom.

Keywords; Face recognition, Face detection, Viola-Jones algorithm, Deep Learning, Convolution Neural Network

I. INTRODUCTION

Attendance is being monitored in Educational institutes, Government offices, and IT companies to maintain a record of its students or employees. There are different ways to carry out this process like biometric attendance monitoring or maintaining or keeping a register book to record attendance out of these the most commonly used method in most of the educational institutes is roll call list, This method is time consuming and also fake attendance can be marked. This becomes injustice for the regular students who attend their lectures regularly. Therefore in order to overcome all these issues an attendance monitoring system can be used this system is designed in such a way that it would capture images of the classroom during the lecture and then mark the attendance of the recognized students. This system will save the time of the lecturer or the staff administrator also no fake attendance would be recorded.

II. LITERATURE SURVEY

Divya Singh, et al. [1] proposed Principal component analysis for 'Attendance monitoring system using Image processing'. The system marked the attendance of the students using face projections on a feature space that spans the significant variations among known face images. The significant features are known as "Eigen faces". Advantage of the system is it marks attendance by detecting facial Eigen features. Disadvantage of the system is it requires proper lightening conditions to work.

Aziza Ahmedi, et al. [2] proposed 'An Automatic Attendance System Using Image processing' the system used a camera that captures a video of class and sends to administrator server using web service. Features of face are extracted using Local Binary Pattern (LBP) and Histogram of Oriented Gradients (HOG), the features are eyes, nose, and mouth, and then it is subjected to the Support Vector Machine (SVM) classifier. Advantage of this system is it marks the attendance of the recognized faces automatically, Disadvantage is the recognition is carried out one by one and not in parallel so it requires a lot of time.

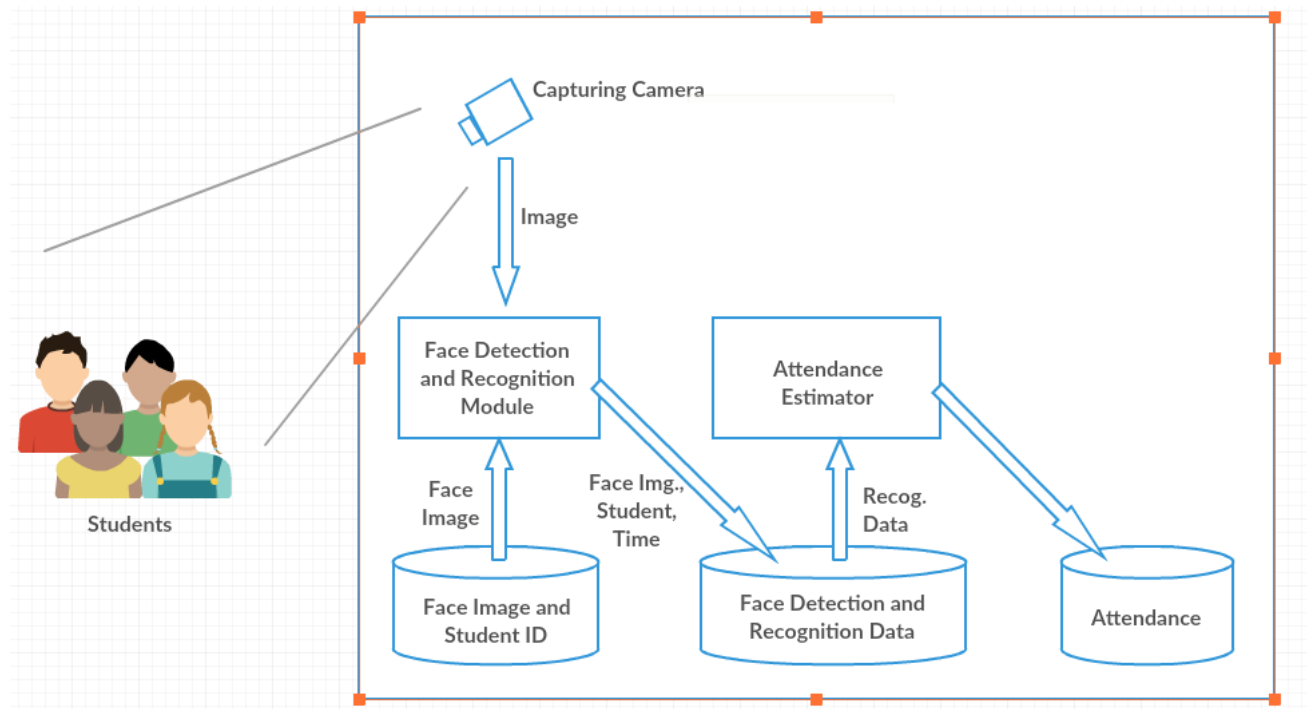
Pooja G.R, et al. [3] proposed Viola Jones Framework Algorithm for 'Automated Attendance System Using Image Processing'; the system consisted of video camera situated at a height in a classroom for capturing video frames. After capturing the face images are extracted using HAAR features and then analysed using Gray-Level Co-occurrence Matrix (GLCM) Advantage of this system it has a detection of 90 percent and recognition has 80 percent.

Prof. Sumita Chandak, et al. [4] proposed Automated Attendance System for 'A Prototype of Automated Attendance System Using Image Processing' the system consisted of video camera situated at a height in a classroom for capturing video frames After capturing the face images are extracted using Viola-Jones algorithm. Advantages of this system is it makes a report of all the students whose attendance is marked and sends it via email to the respective teachers also an SMS is sent to their parents if the attendance is low. Disadvantage of the system is it detects dummy images and recognizes the dummy faces.

Shijie Xiao, et al. [5] proposed Affinity matrix and low-rank representation for 'Automatic Face Naming by Learning Discriminative Affinity Matrices From Weakly Labelled Images' which names the faces detected by the system by using machine learning algorithms and face detection inside images captured. Advantage of the system is it automatically names the persons. Disadvantage of the system is it needs to be trained for te persons who are not famous.

III. PROPOSED ARCHITECTURE

The proposed system captures images at regular intervals of time during the complete lecture, Faces are detected from the captured images after detection by using Face recognition technique (convolution neural network) the system will recognize the faces and mark the attendance of the recognized students.



The system consists of a database where the faces of students are stored with their respective roll numbers, the system will then match the faces of the captured images with the database and mark the attendance of the students whose face is recognized. New students can be added by the system administrator by taking sample shots of the student and then the system will extract the features of the face and save it in the database.

IV. APPLICATIONS

The system can be used in Educational institutes, Universities etc it can also be used in Government offices as well as in IT companies.

V. CONCLUSION AND FUTURE SCOPE

We have proposed an Image and Machine learning based attendance monitoring system for classroom. Unlike the traditional manual marking of attendance which can mark fake attendance our system will detect faces from the classroom and mark attendance accordingly by feature extraction and matching by using machine learning techniques. We implemented Convolution Neural Network algorithm and evaluated the performance. Our results showed that the detection is accurately carried out of the faces of students present in the classroom.

The system can be scaled out to be used in Universities where the attendance is recorded and maintained where students are awarded grade points on overall performance of their academic activities.

VI. REFERENCES

- [1] Ming-Hsuan Yang, David J. Kriegman, Narendra Ahuja, "Detecting Faces in Images: A Survey". IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 24, no.1, 2002, pp 35-39
- [2] M.Gopi Krishna, A. Srinivasulu, " Face Detection System On AdaBoost Algorithm Using Haar Classifiers". International Journal of Modern Engineering Research (IJMER), Vol. 2, Issue. 5, pp 3556-3557
- [3] Ijaz Khan, Hadi Abdullah and Mohd Shamian Bin Zainal, "Efficient Eyes And Mouth Detection Algorithm Using Combination Of Viola Jones And Skin Color Pixel Detection". International Journal of Engineering and Applied Sciences Vol. 3, No. 4 2013, pp 52-53.
- [4] Viola and M. Jones, "Fast and Robust Classification using Asymmetric AdaBoost and a Detector Cascade"

- [5] F. Schroff, D. Kalenichenko, Dmitry and J. Philbin, "FaceNet: A Unified Embedding for Face Recognition and Clustering". CVPR, 2015
- [6] Cole Murray, "Building a Facial Recognition Pipeline with Deep Learning in Tensorflow", hackernoon.com[Internet]. Available: <https://hackernoon.com/building-a-facial-recognition-pipeline-with-deep-learning-in-tensorflow-66e7645015b8>
- [7] NP Hard and NP-Complete Classes [Internet], Tutorialspoint, Available: <https://goo.gl/kLWJji>
- [8] Andrew Powell-Morse, "Iterative Model: "What Is It And When Should You Use It?" [Internet], SDLC 2016. Available: <https://airbrake.io/blog/sdlc/iterative-model>
- [9] J. Ashbourn, Avanti, V. Bruce, A. Young, "Face Recognition Based on Symmetrization and Eigenfaces
- [10] M. Turk, A. Pentland, "Face Recognition Using Eigenfaces"
- [11] Convolutional Neural Networks for Visual Recognition [Internet]. Available: <http://cs231n.github.io/convolutional-networks>
- [12] M. D. Zeiler and R. Fergus, "Visualizing and understanding convolutional networks". CoRR, abs/1311.2901, 2013