E - Attendance System Using Opencv and CNN

Mr. Omkar Sawant[1], Mr.Yash Jain[2], Mr. Anand Kulkarni[3],

Mr. Shubham Salunkhe[4], Prof. Mrs Shantiguru[5]

Student, Comp Dept, D Y Patil College of Engineering, Pune, India[1,2,3,4]

Guide, Comp Dept, D Y Patil College of Engineering, Pune, India[5]

Abstract: In modern times, face recognition is the key aspect of computer vision. There are at least two reasons for this trend the first is the commercial software, and the second is the availability of practical technologies after years of research. Due to the very nature of the problem, computer scientists, neuro-scientists, and psychologists all share a keen interest in this field. We proposed a system that is based on face detection and recognition algorithms, which automatically detects the student when he/she enters in the classroom and marks the attendance by recognizing him/her. This system is developed by capturing real-time human faces in the class. Finally, the absentee lists are displayed on android application for confirmation. This System can be used in Government Schools and Colleges to monitor and validate attendance.

Keywords: Attendance, Opencv, CNN, Question Paper

I. INTRODUCTION

Detection of faces is a problem in computer vision, and has been researched for applications such as face verification, person identification, etc. The method is based on deep CNN have achieved remarkable results for the face detection task, it is still difficult to obtain facial landmark locations from face images containing extreme poses, illumination and resolution variations. Various tasks such as face detection, landmark localization, pose estimation and gender classification are problems solved separately. Recently, it is proved that machine learning tasks performed simultaneously can boost the performance of individual tasks. In this system, we propose a novel framework is based on CNNs for face detection, facial landmarks localization, head pose estimation and gender recognition. We exploit the fact that information contained in features is hierarchically distributed throughout the network as demonstrated. Lower layers contain better localization properties. They are appropriate for learning landmarks localization.

On the other hand, deeper layers are for learning complex tasks such as face detection and gender recognition. It is clear that we need to use all the layers of a deep CNN in order to train different tasks. We represent a stack of local histograms for multilevel image coding. Since a CNN architecture contains multiple layers with hundreds of feature maps in each layer, the overall dimension of hyper-features is too large to be efficient for learning multiple tasks. Moreover, the hyper-features must be associated in a way that they efficiently encode the features common to the multiple tasks. This can be handled using feature fusion techniques. Features fusion aims to transform the features to a common subspace where they can be combined linearly or non-linearly. Recent advances in deep learning have shown that CNNs are capable of estimating an arbitrary complex function.

We create a unique fusion-CNN to fuse the hyper-features. In order to learn the tasks, we train them simultaneously which leads to higher efficiency and lower execution time. In this way, the features get better at understanding faces, which leads to increased efficiency in the performances of individual tasks. The deep CNN combined with the fusion-CNN can be learned together from one end to another. We do performance of face detection, landmarks localization, pose estimation and gender recognition tasks using off-the-shelf Region-based CNN approach. Furthermore, we propose a system that uses a multitask approach without fusing the intermediate layers of CNN. Detailed experiments show that multitask learning performs better at face recognition than methods based on individual learning.

II. LITERATURE SURVEY

"Hyper Face :A Deep Multi-task Learning Framework for 4Face Detection, Landmark Localization, Pose Estimation, and Gender Recognition." Rajeev Ranjan, Member, IEEE, Vishal M. Patel, Senior Member, IEEE, and Rama Chellappa, Fellow, IEEE. Transactions on Pattern Analysis and Machine Intelligence,2017.[1]

 This study presents an algorithm for simultaneous face detection, landmarks localization, pose estimation and gender recognition using deep Convolutional Neural Networks (CNN). The proposed algorithm ,Hyper-Face, fuses the

intermediate layers of a deep CNN using a separate CNN followed by a multi-task learning algorithm that works on the fused features.

**"Attendance Monitoring System using Facial Recognition with Audio Output and Gender Classification".
Poornima, Sripriya, Vijayalakshmi, Vishnupriya. IEEE International Conference on Computer, Communication, and Signal Processing, 2017 [2]**

This paper aims in presenting an automated attendance System - AUDACE. This system automatically detects the student in the classroom and marks the attendance by recognizing their face. This system is developed by capturing realtime human faces in the class. The detected faces are matched against the reference faces in the dataset and marked the attendance for the attendees. Finally, the absentee lists are said aloud through voice conversion system for confirmation. Secondly, the system is trained to classify the gender of the students present in the class.

"**AUTOMATIC ATTENDANCE MANAGEMENT SYSTEM USING FACE DETECTION."Nirmalya Kar, Ashim Saha, Dr. Mrinal Kanti Deb Barma.Online International Conference on Green Engineering and Technologies (IC-GET),2016[3]**

Abstract : In this paper we are going to describe the attendance without human interference. In this method the camera is fixed in the classroom and it will capture the image, the faces are detected and then it is recognized with the database and finally the attendance is marked. If the attendance is marked as absent the message about the students absent is send to their parents. There are various methods for comparing the faces. The Eigen face is the one of the method. Eigen faces is set of Eigen vectors which are used in computer vision problem of face recognition.

"Study of Implementing Automated Attendance System Using Face Recognition Technique."Yuxi Peng , Luuk Spreeuwers, Raymond Veldhuis. 3rd IEEE International Conference on "Computational Intelligence and Communication Technology" (IEEE-CICT 2017)[4]

This paper describes a method for Student's Attendance System which will integrate with the face recognition technology using Personal Component Analysis (PCA) algorithm. The system will record the attendance of the students in classroom environment automatically and it will provide the facilities to the faculty to access the information of the students easily by maintaining a log for clock-in and clock-out time.

III.   PROPOSE SYSTEM

In a proposed system, Teacher get register with system and login with system ,first the image is captured of the class for marking students attendance in a specific classroom. Next, the captured image is stored in database for storing the logger values. After this, the captured image is processed using CNN model architecture. In this the image features are extracted using Viola Jones method. This extracted features are classified and stored in a machine learning data-set, using SVM. After classification the faces in image are identified from the image data-set. And ,then the person in the image is identified uniquely by his name. If the person is identified, his attendance is marked in a simple database management system and sent to server for cloud storage. When a student wants to see his attendance the data is received from server and displayed to him via. an android application. In android application, we can view daily, weekly, monthly and annual report of a specific students attendance. Open Cv is used for image training and image picking process.

IV.   SYSTEM ARCHITECTURE

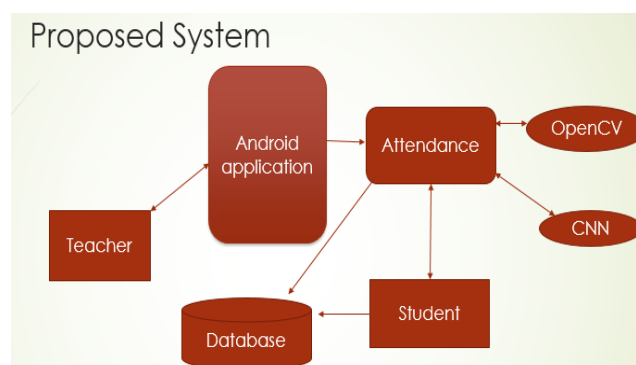Following diagram is our system's architecture diagram:

Figure 1: system architecture

In this proposed system Teacher get register with system with unique id and password and after successful registration can login with system For capturing images and processing the images CNN algorithm is used. The captured images is stored in database for classification of images for attendances system. And opencv is used for the purpose of images pre-processing.

V.   METHODOLOGIES

1. CNN algorithm Network:
In that MRI images is process and analyse and classify So using CNN algorithm.

Convolution Neural:
In machine learning, a convolutional neural network is a class of deep, feed-forward artificial neural networks that has successfully been applied to analyzing visual imagery. Convolution neural network algorithm is a multilayer perceptron that is the special design for identification of two-dimensional image information. Always has more layers such as input layer, convolution layer, sample layer and output layer. CNNs use comparatively small pre-processing is compared to other image classification algorithms. it means that the network learns the filters that in algorithms were hand-engineered.

2. Open Cv:
OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. In this system open cv library is used for image processing for the purpose of online attendance face recognition images.

VI.   CONCLUSION

Thus In this way, we proposed a system which works on concept of machine learning, Image processing and Android app creation, which keeps a track of an educational institutional students attendance record at run-time and gives a report to all the individuals, part of these system. It also provides various features, according to the individual present, such as for teacher, message sending rights, for admin removing or adding an individual and so on. As image processing and ML combined is a research field, our system can be extended to performing better, this can be its future scope. Also, it can be improved by getting a more clear image and processing a high resolution in less time. Thus increasing the efficiency of time and space complexity, by building a better or revising the current Feature extraction and classification algorithms.

VII.   RESULT
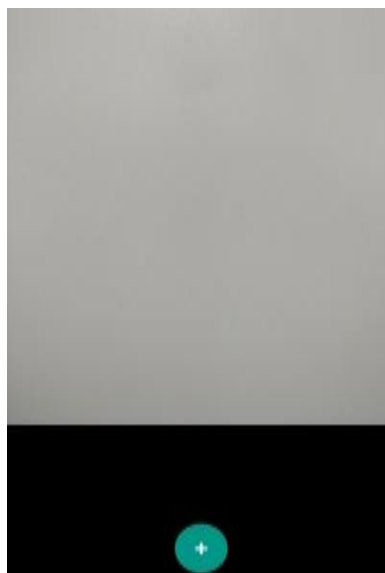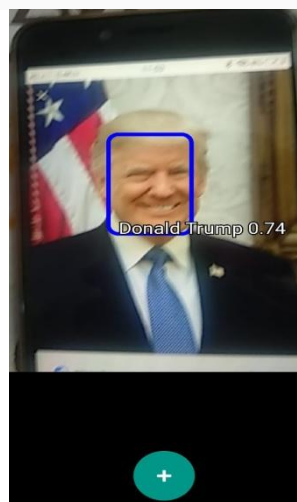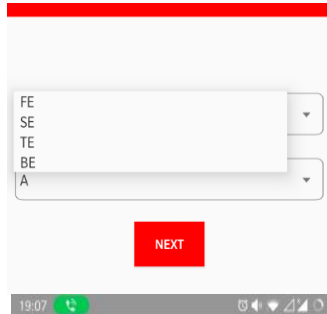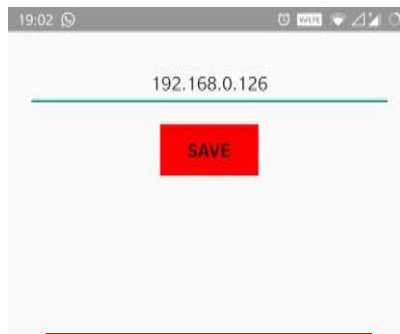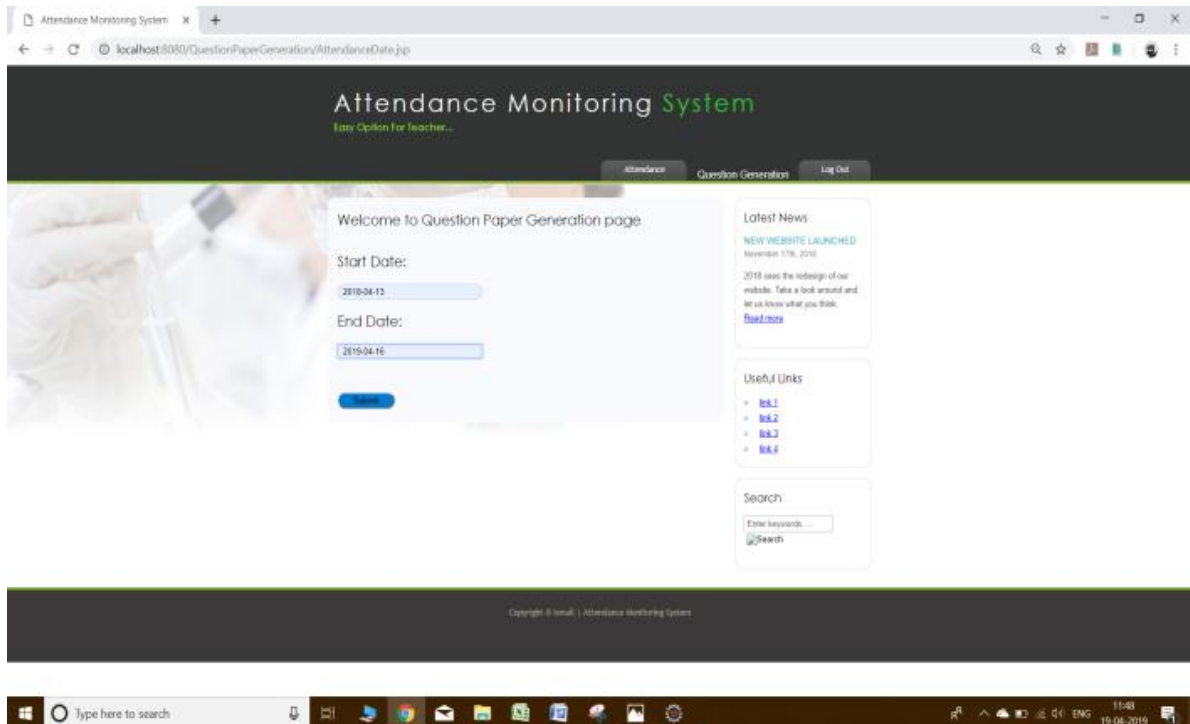
REFERRENCES

[1]. Balcoh N. K Yousaf M. H, Ahmad W. and Baig M. I. (2012) Algorithm for Efficient Attendance Management: Face Recognition based approach. IJCSI International Journal of Computer Science Issues, 9 (4): 146-150

[2]. FBI (2017) Face Recognition. Available at: https://.fbi.gov%2Ffile-repository%2Fabout-us-cjis-fingerprints_biometrics-biometric-center-of-excellences-face-recognition.pdf. Accessed 14 January 2017.

[3]. Sato A., Imaoka H., Suzuki T. and Hosoi T. (2005) Advances in Face Detection and Recognition Technologies. NEC Journal of Advance Technology, 2 (1): 28-34.

[4]. Kisku R. and Rana S. (2016) Multithread Face Recognition in Cloud. Available at: https://www.hindawi.com/journals/js/2016/2575904/. Accessed 14 January 2017.

[5]. Caldeira R. (2013) Face ID-Cloud: Face Recognition Leveraging Utility and Cloud Computing. 2017

[6]. Gaddam S. C. 251, Ramesh N. V. & Dhanekula H. (2016) Face Recognition Based Attendance Management System with Raspberry Pi 2 Using Eigen Face Algorithm. ARPN Journal of Engineering & Applied Sciences, 11 (13): 8107-8112.

[7]. Muthu K. and VeeraA. (2013) Smart Application for AMS Using Face Recognition. Computer Science & Engineering: An International Journal (CSEIJ), 3 (5): 13-20.

[8]. Orobor A. and Orobor H. (2018) Cost-Saving and Internally Generated Revenue in Tertiary Educational Institutions: The Role of Cloud Computing. International Journal of Education and Information Technology