ATTENDANCE SYSTEM FOR FACE VALIDATION USING NEURAL NETWORK AND SUPERVISED MACHINE LEARNING TECHNIQUES

[1]R.Rajamoorthi, [2]Nivedhya T P, [3]. Mrs.N.Kavitha
[1]II MCA, Paavai Engineering College, Namakkal
[2] II MCA, Paavai Engineering College, Namakkal
[3] Professor, Department of MCA, Paavai Engineering College, Namakkal

Abstract: - It has been established those traditional methods of tracking student mobility during class, such as roll-numbering and sign-in sheets, are inefficient when it comes to the time and labor of staff Human mistakes and fraudulent travel can potentially catch them, introducing errors into the data that is captured. To improve the way we track our attendance in classrooms, numerous research has been undertaken. However, a lot of the alternatives that have been suggested are both expensive and unsuccessful. Numerous strategies fall short in addressing phony visits. a cheap method of keeping track of students' attendance. Students confirm their presence by merely pointing their faces to store records, and attendance is noted on photographs of their peers.Since mobile devices serve as the primary means of system interaction, mobile applications are created with students and instructors in mind. Controlling a computer-based system on a global scale might be quite difficult when it comes to authentication . In the past, human face recognition has played a significant role in numerous applications, including network security, video surveillance, departmental control, and computer communications . Real-time facial recognition technology with a database of data on college students as the default presence setting. The real-time output of the image is a constant issue, making this operation highly challenging. In addition, the current system faces extra difficulties in maintaining a database with a large amount of student data.The proposed system can provide facial recognition using straightforward, quick algorithms and, most significantly, achieve a high accuracy rating .

Keywords: Support vector machine, Face Recognition, Convolutional Neural Network, Machine Learning

I. INTRODUCTION

Being one of the sub-parts of PC vision, faceidentification and acknowledgment frameworks were at first expected forpublic observation purposes. Be that as it may, the steadily diminishingsize improved computational power and reasonable costs ofthe semiconductors lead to an expansion in the assortment and numberof utilization of face acknowledgment frameworks in each daylife, industry, and the scholarly community.In this review, a face acknowledgment framework is created forgauging the participation of understudies. Research recommends that understudies ‘participation is straightforwardly corresponding to successful learningwhat's more, understudy maintenance [1], [2]. A few computerized models ofparticipation are utilized in schools and colleges and they are broadly concentrated on in the writing. One of these techniques is using a finger impression understanding gadget, which can be all things consideredput before the study hall, or handheld [3]. A comparableapproach is utilizing an RFID card for gauging participation[4]. As the gadgets utilized in the two techniques can be

utilized by asingle understudy at a time, these methods represent an issue of time.Moreover, the RFID technique is inclined to false endeavours,as any understudy can utilize their friend's card rather thantheirs. Applications utilizing Bluetooth correspondence conventioncomprise another other option, wherein either the Bluetooth association of understudies' cell phones is straightforwardly utilized [5]or then again exceptional Bluetooth labels [6] or guides [7] are used toproduce the participation list consequently.Scholarly examination on PC vision-based approachesto participation taking has picked up has acquired speed in theongoing years as these strategies give lower time utilizationwhat's more, higher exactness contrasted with the traditional counterparts. In [8], the pictures taken by a camcorder installedinthe homeroom are utilized to identify and perceive the understudiesas they enter the homeroom, and to check the participation list.

The presentation of different component extraction and classification strategies is tried for an information base of 80 people. In[9], Discrete Wavelet Transform (DWT) and Discrete CosineChange (DCT) strategies are utilized for highlight extractionalso, Radial Basis Function (RBF) Network is utilized for theacknowledgment task with a triumph pace of 82% for a dataset of148 pictures of 16 people. In [10], successive layers ofConvolutional Neural Networks (CNN) are utilized to make faceinserting as elements for the face acknowledgmenttask. Then, at that point, and SVM is utilized as a classifier with a success pace of 95% for a five-individual dataset while in [11], an extra PCA strategyis applied to the CNN highlight extractor, and Mahalanobisdistance is utilized as a classification strategy.The primary target of this study is to foster a PCvision-based face acknowledgment framework with the end goal of automated participation takingFor the face acknowledgment classifier, bothconventional and AI PC vision methods are utilized. Moreover, a veil checking highlight is tooincluded intotheframework as an action against the Covid-19pandemic, which can be utilized to distinguish understudies who aredisregarding the guidelines on masks. The association of the paper is as per the following: In SectionIIthe technique of the review is introduced where the strategiesfurthermore, calculations utilized for face recognition, face recognition, and clinical face identification are made sense of and testapplication results are introduced. In section III the subtletiesof the created graphical User Interface are presented.At last in Section-IV closing comments and future work aresummed up.

II. METHODOLOGY

In this review, a mechanizedparticipation-taking framework alongwith a ca clinically veil locator is carried out. In facerecognition, designs of a similar mathematical shape, for example,eyes, nose, and mouth alongside their relations to one anotherare utilized to distinguish a human face in a computerized picture. On theother hand, in face acknowledgment, the similitude rates betweenrecently recorded face information and another face picture are usedto distinguish or check an individual. As a general rule, the posture of the head, thelight power of the climate, and the impediment of the face can influence the exactness of a face acknowledgment framework.

Face Detection

The most important phase in tace acknowledgment is the recognition of theface. For this reason, two different face recognition calculations,to be specific Histogram of Oriented Gradients (HOG) [12] andHaar-Cascade [13], are applied and their exhibitions areanalyzed.The histogram of arranged angles (HOG) technique dependson the difference in various districts of pictures The fundamentalbenefit of this strategy is that the impact of lighting, by the same tokenabundance or absence of it, affects the inclinations.Haar-overflow is another strategy, wherein the changebetween the light and the dull regions is utilized to surmise the sortof highlights which are then used to identify items, for example,lines, edges, faces, eyes, vehicles, and so forth on a given picture. Whenutilized for the face location, by and large, three unique kinds ofHaar-like highlights are utilized to decide face parts. In this method, theamount ofthe pixel

values under the light region are deducted from theamount of the pixel values compared to the dull region.Applying Haar-like highlights with various sizes in variousareas and playing out the connected computations may be time-consuming and computationally awkward. To mitigate thisissue and to recognize the most reasonable highlights, by and large, AdaBoost calculation is utilized, which decides edgeesteem which will arrange positive and negative pictures. Oncethe reasonable elements are recognized, the following stage is gathering the highlights into various stages and applying them in an outpouringway individually. Assuming the district flops in one of the stages, thatarea will be disposed of and the ensuing stages will notbe carried out. Utilizing the Haar-Cascade strategy, appearances ofvarious scales are not set in stone. Nonetheless, the exhibitionof this technique changes with the posture of the headfurthermore, it is less hearty to occlusion. In this review, both HOG and Haar-overflow techniques areexecuted utilizing dlib [14] and OpenCV [15] libraries, andtheir exhibitions with regards to precision and demanded investmentare analyzed. An image taken from a study hall with 19understudies is utilized as the test picture, which is first changed over intogreyscale. As to results, itcan be seen that the HHOG calculation can give higherexactness in a similar time. Thusly, in the ensuingportions of this review, HOG calculation is used rather than theHaar-overflow technique.

Face Recognition

To decrease the reliance on the presentation of the faceacknowledgment calculation from the posture of the head, the facemilestone assessment calculation created in [16] is applied, bywhich the 68 directions related to various facial designslike eyes, lips and not entirely settled on the pictureUtilizing these directions, different estimations including thewidth of the nose, the distance between eyes and so on can bemade for every individual. Rather than making direct correlationsbetween the estimations got from the picture and thoseput away in the data set, profound learning methods can be usedto recognize the individual on the picture, as they give betterexactness under changing natural circumstances In this review, a convolutional neural organization (CNN) architecture is utilized to encode faces into 128-layered vectors.The secret layers of the organization comprise two arrangements of consecutive layers, where each set contains two convolutional layersfollowed by a maximum pooling layer. In the convolutional layers,the quantity of 3−by−3 bits is set to 32, and amended straightunit (ReLU) is liked over sigmoid or exaggerated digressionas the actuation capability to diminish the computational burden.In the result layer of the CNN, three thickly associated layersare utilized. In the last completely associated layer, softmax enactmentcapability is utilized to process the result of the organization. Toforestall overfitting, bunch standardization and dropout techniquesare embraced.During the preparation period of the CNN calculation picturesare utilized in trios to expand the exactness of the encoding,In this review, a convolutional neural organization (CNN) architecture is utilized to encode faces into 128-layered vectors.The secret layers of the organization comprise two arrangements of consecutive layers, where each set includes two convolutional layersfollowed by a maximum pooling layer. In the convolutional layers,the quantity of 3−by−3 pieces is set to 32, and redressed directunit (ReLU) is liked over sigmoid or exaggerated digressionas the initiation capability to diminish the computational burden.In the result layer of the CNN, three thickly associated layersare utilized. In the last completely associated layer, softmax actuationcapability is utilized to process the result of the organization. Toforestall overfitting, bunch standardization and dropout techniquesare embraced.During the preparation period of the CNN, calculation picturesare utilized in trios to expand the exactness of the encoding,where two pictures have a place with a similar individual though the thirdone is of someone else. The goal capability of the CNNcalculation refreshes the channels with the end goal that the 128 layeredencodings of the pictures from a similar individual become nearerwhile the third encoding shift further away from the two.The data set used to prepare the organization

comprises pictures of understudies, who are taking a similar class. The photosare downloaded from the Student Management System ofthe college by the educator and transferred to the information basewith the name data for everyone. After finishing the"trio" preparation on the picture dataset, loads of the CNNmodels are acclimated to produce a 128-layered vector forevery individual, which is then utilized by a Support Vector Machine(SVM) classifier to distinguish the understudies[17]. First,the appearances the not entirely settled. For each face, a 128-layered vector is created, which is contrasted and thepre-prepared vector estimations in the dataset and the nameof the individual are recovered from the data set. The flow chart for the face recognition system is shown in Figure 1.

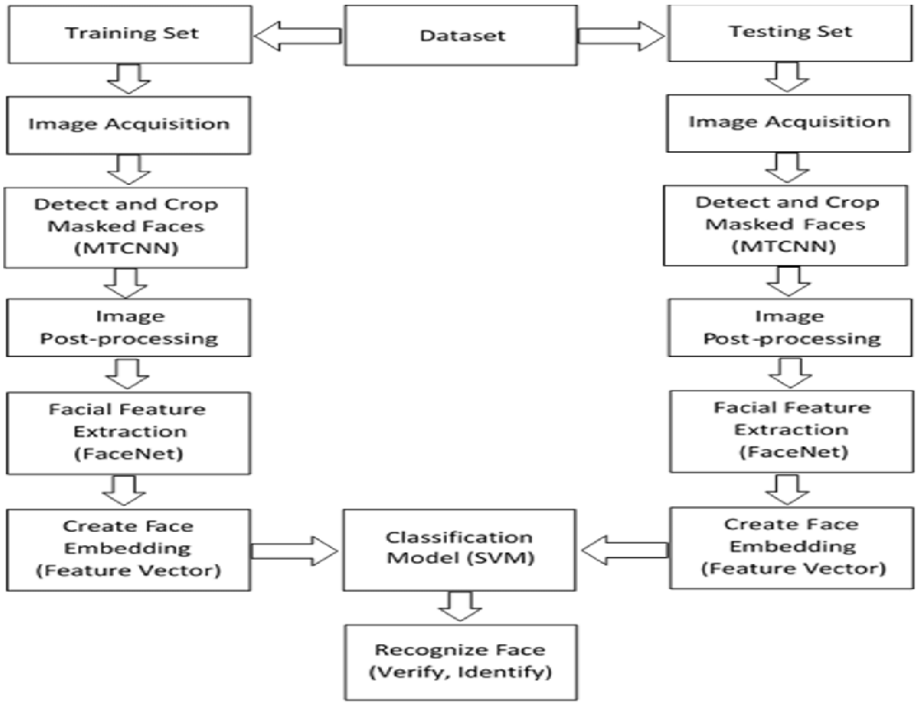

Figure 1: Face Recognition System

III. ATTENDANCE USER INTERFACE

The proposed program participation framework has the accompanying capacities.

1. Student Register- to enter the names and face pictures ofthe understudies into the information base
2. Student Attendance -to think about face encoding in the picturecaught by the camera with the encodings accessible inthe information base and generate the participation list
3. Train the System- to make understudy face encodings fromtheir face pictures
4. Send Attendance utilizing email- to send the participationrundown of an ideal date to the instructor(s) through email.
5. Expunge the student list- to deletestudent arrangements ofthe predetermined dates
6. Check the recent attendance list- to see a rundown of the recently created.

participation records In the created framework, educators have their usernames and passwords to enter the framework. When the "Attendance" button is squeezed, a spring-up window will be opened toempower the client to enter the username and secret phrase. If thedata given by the client is right, the client can log into the framework by tapping the login button and utilizing the givenhighlights. Then again, if the given data ismistaken, a window with a blunder message will be openedand all capabilities will be deactivated.When the "Student Attendance" choice is chosen, theprogram first snaps the picture of the study hall utilizing the camera joined to the PC. Utilizing CNNs, face acknowledgmenttasks will be performed on the caught picture and a rundownof the understudies distinguished on the picture will be produced. This participationrundown can be shipped off to the teachers both in text and Excel design.

IV. CONCLUSION

In this review, a robotized participation-taking framework iscreated and carried out. For the face recognition section, twogenerally utilized face discovery calculations, specifically Histogram ofSituated Gradients and Haar-Cascade calculations, are appliedfurthermore, tried on a picture taken from a study hall. Concerningacquired results, it is seen that HOG calculation givesbetter exactness under changing lighting conditions. For theface acknowledgment, profound learning givenconvolutional neural networks (CNNs) alongside an SVM classifier is utilized.What's more, a cover checking calculation is likewise evolvedwhich can be utilized in the homerooms for the distinguishing proofunderstudies, who are not wearing a cover or wearing it inappropriately.A graphical UI (GUI) framework is planned, whichempowers teachers to create participation consequently, toadd new understudies, or to take a look at the participation of a pastdate.In this work, the pictures of the understudies are saved tothe data set physically by the teacher. In future work,it is planned to incorporate the formed framework into theUnderstudy Management System of the college/school, which can give programmed age of the information base for eachclass.

REFERENCES

[1] T. Fadelelmoula, "Impact of class attendance on student performance," *International Research Journal of Medicine and Medical Sciences*, Jun. 2018.

[2] D. O. Allen and D. J. Webber, "Attendance and exam performance at university: a case study," *Research in Post-Compulsory Education*, vol. 15, no. 1, pp. 33–47, Mar. 2010, publisher: Routledge eprint: https://doi.org/10.1080/13596740903565319.

[3] B. K. P. Mohamed and C. V. Raghu, "Fingerprint attendance system for classroom needs," in *2012 Annual IEEE India Conference (INDICON)*, Dec. 2012, pp. 433–438, iSSN: 2325-9418.

[4] B. Dias, A. Mohammad, H. Xu, and P. Tan, "Intelligent Student Attendance Management System Based on RFID Technology," in *Complex, Intelligent, and Software Intensive Systems*, ser. Advances in Intelligent Systems and Computing, L. Barolli, F. K. Hussain, and M. Ikeda, Eds. Cham: Springer International Publishing, 2020, pp. 578–586.

[5] V. Bhalla, T. Singla, A. Gahlot, and V. Gupta, "Bluetooth based attendance management system," *International Journal of Innovations in Engineering and Technology (IJIET)*, vol. 3, no. 1, pp. 227–233, 2013.

[6] R. Lodha, S. Gupta, H. Jain, and H. Narula, "Bluetooth Smart Based Attendance Management System," *Procedia Computer Science*, vol. 45, pp. 524–527, Jan. 2015.

[7] M. Bori´c, A. Vilas, and R. D´ıaz Redondo, "Automatic Attendance Control System based on BLE Technology," Jan. 2018, pp. 289–295.

[8] S. Chintalapati and M. V. Raghunadh, "Automated attendance management system based on face recognition algorithms," in *2013 IEEE International Conference on Computational Intelligence and Computing Research*, Dec. 2013, pp. 1–5.

[9] S. Lukas, A. R. Mitra, R. I. Desanti, and D. Krisnadi, "Student attendance system in classroom using face recognition technique," in *2016 International Conference on Information and Communication Technology Convergence (ICTC)*, Oct. 2016, pp. 1032–1035.

[10] M. Arsenovic, S. Sladojevic, A. Anderla, and D. Stefanovic, "FaceTime — Deep learning based face recognition attendance system," in *2017 IEEE 15th International Symposium on Intelligent Systems and Informatics (SISY)*, Sep. 2017, pp. 000053–000058, iSSN: 1949-0488.

[11] E. Winarno, I. Husni Al Amin, H. Februariyanti, P. W. Adi, W. Hadikurniawati, and M. T. Anwar, "Attendance System Based on Face Recognition System Using CNN-PCA Method and Real-time Camera," in *2019 International Seminar on Research of Information Technology and Intelligent Systems (ISRITI)*, Dec. 2019, pp. 301–304.

[12] N. Dalal and B. Triggs, "Histograms of oriented gradients for human detection," in *2005 IEEE computer society conference on computer vision and pattern recognition (CVPR'05)*, vol. 1. IEEE, 2005, pp. 886–893.

[13] P. Viola and M. Jones, "Rapid object

detection using a boosted cascade of simple features," in *Proceedings of the 2001 IEEE computer society conference on computer vision and pattern recognition. CVPR 2001*, vol. 1. IEEE, 2001, pp. I–I.

[14] D. E. King, "Dlib-ml: A machine learning toolkit," *The Journal of Machine Learning Research*, vol. 10, pp. 1755–1758, 2009, publisher: JMLR. org.

[15] G. Bradski, "The OpenCV Library," *Dr. Dobb's Journal of Software Tools*, 2000.

[16] V. Kazemi and J. Sullivan, "One Millisecond Face Alignment with an Ensemble of Regression Trees," 2014, pp. 1867–1874.

[17] M. S. Kumar and Y. S. Kumaraswamy, "An improved support vector machine kernel for medical image retrieval system," International Conference on Pattern Recognition, Informatics and Medical Engineering (PRIME-2012), 2012, pp. 257-260, doi: 10.1109/ICPRIME.2012.6208354.