iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** XII **Month of publication:** December 2021

DOI: https://doi.org/10.22214/ijraset.2021.39732

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 9 Issue XII Dec 2021- Available at www.ijraset.com

A Review on Online Classroom Attendance Marking System Using Face Recognition, Python, Computer Vision, and Digital Image Processing

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Abstract: The face is that the identity of someone. The tactic to appear out this physical feature has seen an exquisite change since the advent of the image processing method. Attendance is monitored in every school, college and library. The regular method for attendance is for teachers to call student name & mark attendance. Nowadays, AI has been explored for computer vision-related applications. So, we use the neural network concept in Face recognition for automatically attendance marking systems. This project will perform the face recognition and face detection algorithms, to generate the computer systems strength of acquiring and recognizing human faces fast, accurately, and precisely in live streams so that the systems can be used in the marking attendance

I. INTRODUCTION

Attendances of every student are being kept up by each school, college, and university. Teachers are maintaining proper records for attendance. The attendance system could even be a method for the particular person and is also applied in many companies, universities, schools, and also in working places. The customary participation checking framework is not productive and requires huge time to organize the record and to calculate the normal participation of each understudy. The traditional way of attendance marking has drawbacks. ancient ordinary methods for understudy participation are still used by several colleges. As this ordinary method is used, many Pupils are gives fraudulent attendance to their colleagues by signing in their attendance in case they are absent in the classroom. The attendance of the student in an online classroom can be determined in different ways namely,

A. Attendance by using Google form

Participation administration framework may be a strategy where a teacher concerned with the specific subject google shapes of tests andon-the premise of that they will check their participation in online classes. This attendance or sometimes it happens for that teacher miss someone attendance or students may forget to fill google forms. the problem occurs when we think about the common process of attendance marking in the classroom. the solution to this kind of issue, we should go with an Automatic attendance system. Programmed participation framework may be a strategy to consequently know the presence or the non-appearance of the understudy within the classroom. by utilizing confront acknowledgment and location innovation. It is additionally conceivable to recognize whether the understudy is going to the total lesson or not. Attending the complete class or not. This basic web application, where understudy stamp their participation as it were when lesson gets over by educator. The common Human Face Recognition approaches are,

1) Feature Acquisition based approaches
2) Brightness control approaches

The Feature-based approach moreover known as the nearby confront acknowledgment framework, is utilized in indicating the key highlights of the confront like eyes, ears, nose, mouth, edges, etc, though the brightness-based approach moreover named as the worldwide confront acknowledgment framework, utilized in recognizing all the parts of the picture.

II. LITERATURE SURVEY

The primary purpose of the paper review is to find a solution provided by a different author and consider the imperfection of the system provided by them, giving the best solution.

1) M Rajamanogaran, S Subha, S Baghavathi, Priya Jeevitha sivasmay proposed a framework contactless participation administration framework utilizing fake insight, the test comes about moved forward precision of participation framework. The main aim of Artificial Intelligence (AI) is to develop technology that makes the machines mimic human beings. Learning calculations work on the premise of AI. In particular, machine learning plays a vital role in making algorithms that can be improvised according to their experience. Neural systems are a set of calculations that are composed of manufactured neurons These artificial neurons will imitate biological neurons. Real-time problems can be solved using Artificial Neural Networks (ANN).

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2) Smitha, Pavithra S Hegde, Afshin proposed a framework Confront Acknowledgment based Participation Administration Framework, recognizes the understudy consequently when he enters the lesson room and marks the participation by recognizing him. Ordinarily, understudies' participation is checked physically which spends a parcel of time. The proposed framework gives computerized. Participation of understudies using NFC and confront acknowledgment Proposed system gives automated attendance of students via NFC and face recognition. The precision of participation will increment.

3) Heeral Chauhan, Shubham Gokhale, Ekta Chhatbar, Sompurna Mukherjee, Nikhil Jha proposed a system Student attendance management system, The major steps are detecting and recognizing faces. comparison of recognized faces can be done by crosschecking with the database of understudy. The paper proposed by Zhao (2013) has recorded the challenges of facial distinguishing proof the inconveniences offacial recognizing verification Is the recognizable verification between known and obscure pictures trouble of facial distinguishing proof is the recognizable proof between the known picture and obscure, in expansion, the paper proposed by Pooja G.R. (2010) found out that the planning handle for stand up. To affirm, the understudy interest system is direct and time-consuming. Furthermore, an article proposed by Priyanka Wagh (2015) stated that lighting and different headsets are often problems that could decrease.

4) Shireesha Chintalapati, M.V. Raghunandh proposal ed mechanical participation administration framework based on confronting acknowledgment calculation IEEE International Conference on Computing Insights. Hence demonstrated time-sparing and security. This framework can moreover be utilized to recognize an obscure individual In genuine time scenarios PCA outflanks other calculations with superior acknowledgment rate and true positive rate.

5) Bhattacharya proposed a framework to evade the disadvantages of the conventional manual attendance system. The system is created by the reconciliation of pervasive segments to make a versatile gadget for dealing with the students' attendance utilizing Face Recognition innovation. This paper depicts how real-time face detection and recognition can demonstrate value for the attendance marking of students. Face detection is accomplished utilizing the Viola-Jones algorithm. Confront following from outline to outline was refined utilizing association tracker from DLIB library. A few boundaries were registered, for example, Pose assessment, Sharpness, Image size, Brightness. Low dimensional distinct feature from face image was refined utilizing Convolution Neural Network. The system performs decently with various outward appearances, lighting, and posture of the individual.

6) Arjun Raj an intelligent attendance framework dependent on face recognition was executed the system actualized utilizing LBPH confront recognizer to recognize confront of the person persistently. Raspberry Pi, OpenCV, and DLib utilizing python are the basic prerequisites for this system. A message will be consequently sent to their parents' number utilizing GSM. The creator additionally built an Android app using the MIT application designer for presence verification. The Creator likewise examined. of different algorithms for face recognition in which it's expressed that the LBPH technique achievement rate is 98.5%. interior the paper a table with receptor ect focal points and impediments of diverse strategies on confront acknowledgment is given. To execute the system the producer required a Raspberry Pi 3b module, pi camera, servo motor, and database servers. By utilizing the LBPH algorithm for face recognition the creator overcome the issue of various head orientations and generous impediments.

7) V. Shehu introduces a new automatic attendance marking system, which incorporates computer vision and faces recognition algorithms into the cycle of attendance management. The paper tends to emit, for example, areal-time face detection on environments with, multiple objects equally social and facial recognition algorithm. To detect face-like examples in real-time they utilized the HAAR classifiers. After exploratory perceptions they acquired after insights from each caught picture, there were roughly 70% of effectively distinguished countenances and from them, just 30% were effectively recognized. Furthermore,e for first-year students, the effective identification rate was a lot higher about 56%.

III. PROPOSED SYSTEM

Frameworks plan is the method of characterizing the design, components, modules, interfacing, and information for a framework to fulfill indicated necessities. Frameworks plan might be seen as the application of frameworks hypothesis to item development. The proposed robotized participation framework can be separated into five primary modules. The modules and capacities are characterized in this area. The proposed framework is divided into five modules.

A. Image Capture

In this module, the camera turns on automatically whenever the course gets over, and it captures the picture and saved it into the temporary record which afterward goes for stand up to recognition

B. Face Detection

Appropriate and efficient face detection algorithms constantly improve the performance of face recognition systems. Face geometry-based method, feature-invariant method,

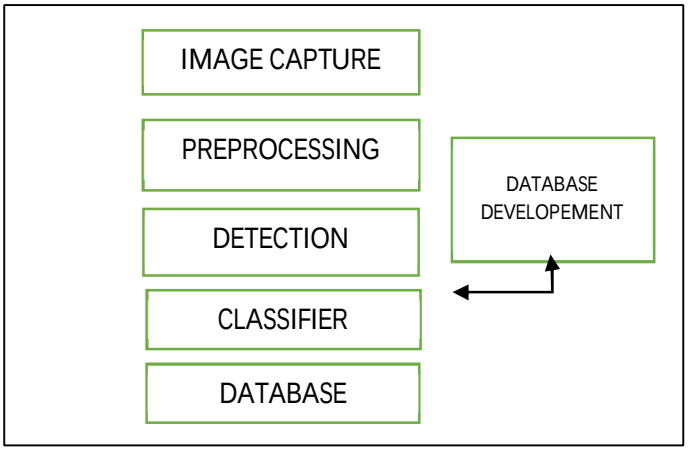


Fig. 3.2.1 Block diagram of attendance marking system

Machine learning-based methods. Out of all these strategies, Viola and Jones proposed a system that gives a tall location rate and is additionally fast, because, it is quick and vigorous Thus we, chose Viola-Jones to confront discovery calculation which makes utilize of the necessary picture. We watched that this calculation gives way better comes about different lighting conditions.

C. Pre-processing

The recognized confront is extricated and subjected to pre-processing. This pre-processing step includes picture editing of the extricated confront picture and resized to histogram equalization. Histogram equalization is the foremost common histogram normalization method. This makes stride the contrast of the picture because it extends the run of the power in a picture by making it more clear. In this process of extracting face, component features like eyes, nose, mouth from the image which capture during recognition.

D. Database Development

This process is to store the database of the user at the time of user registration it stores all the data given by the user and three photos which are later used for attendance marking. At last, after the face detection, extraction, and attendance marking the relevant data get stored and makes an excel sheet of attendance.

E. Feature Extraction and Classification

The execution of a confront acknowledgment upon the highlight extraction and their classification to include the highlight extraction and their classification to include the precise comes about include extraction is accomplished utilizing highlight-based strategies. We compared the comes about of distinctive all-encompassing approaches utilized for highlight extraction and classification in genuine time situations. This system proposed a lightweight face recognition library that mainly used the voilà Jonas algorithm for detection and extraction. Facial highlight extraction is the handle of extricating confront component highlights like eyes, mouth, nose by making confront bend for classification.

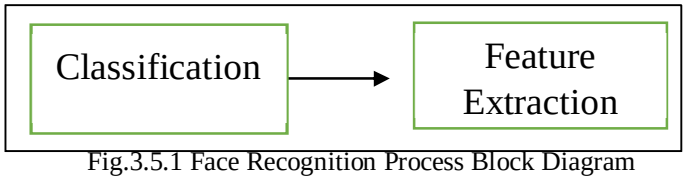


Fig.3.5.1 Face Recognition Process Block Diagram

Confront Acknowledgment inclu in two stages highlight extraction and classification. The over indicated highlight extractors combined with classifiers are compared different veritable world scenarios such as lighting condition, coincidental facial highlight changes expression.

F. Post-processing

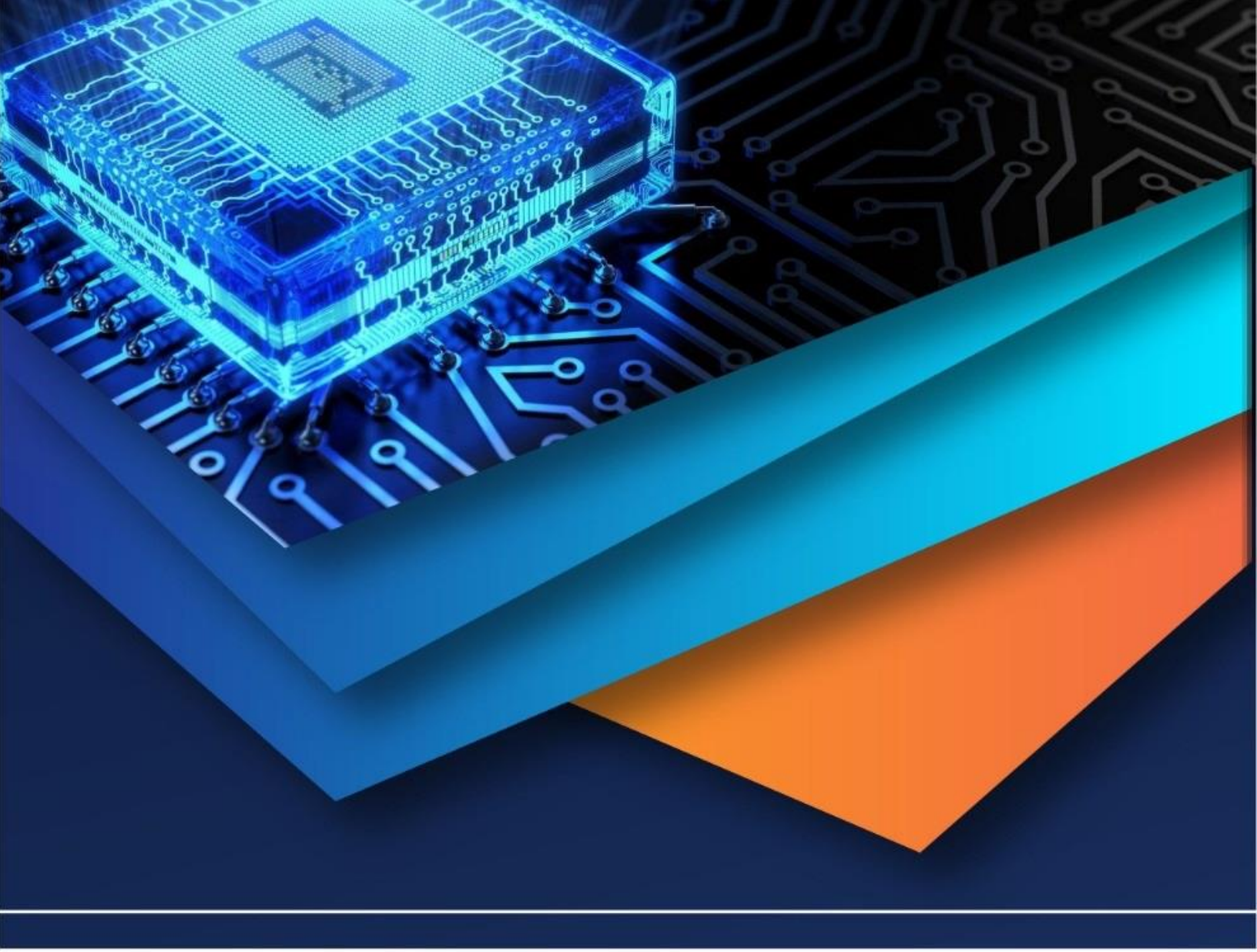
This stage is suggested to save the data after successful attendance marking. So it makes an Exceed expectations sheet spare participation information within the frame of title, information, go to time, our time and spend time on course and status of displayed. After capturing the process and name blinking process, all the data get stored into an Excel sheet

IV. CONCLUSION

The online participation checking framework is based on confronting acknowledgment and the dlib concept. This project is to get Rid of attendance flaws that arise due to the traditional methods. The work has been developed as a touch-free system to prevent students from getting affected by contagious diseases, especially COVID'19. The overall attendance for a class can be easily obtained by calculating the starting time and ending time of the students entering the class. A customized attendance report has been generated automatically, and thus the system enables the faculty to save time for taking attendance in the classroom. In the future, this work can be converted into advanced which is applicable for all domains. Also, 3-D images can be incorporated in the future for producing better accuracy.

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