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Face recognition system using cloud and AI

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ABSTRACT:

Face recognition is one of the most productive image processing applications and plays an important role in the technical field. Human face recognition is a proactive issue for authentication purposes, particularly in relation to student participation. The presence system using facial recognition is a procedure in which student detection is used by the use of facial biostatistics based on high-resolution monitoring and other computer technologies. The development of this system aims to achieve the digitization of traditional systems for their existence by invoking the name and maintenance of pen paper records. Current strategies for participation are boring and time-consuming. The existence file can be easily manipulated by manual recording. Traditional existence processes and current biometric systems are susceptible to lawmakers' influence. After facial recognition, an attendance report is created and saved in Excel format. The system is tested under a variety of conditions, including lighting, head movement, and variations in distance between students and cameras. After a powerful test, the overall complexity and accuracy are calculated. The proposed system proved to be an efficient and robust device for classroom participation without time consumption or manual work. The developed system is inexpensive and requires less installation.

Keywords: face recognition; deep learning, attendance system.

Main text

Today, the technology aims to convey a vast array of knowledge-oriented technological innovations. Deep learning is part of an interesting domain that allows machines to train themselves as input by providing several data records, and can provide the right edition during testing using a variety of learning algorithms. Today, the number of visitors is considered an important factor for both students and teachers in educational organizations. With further development of deep learning technology, the machine automatically recognizes the number of student visitors and maintains the collected data.

In general, the student presence system can be maintained in two different forms: manual visit system (MAS) and automated presence system (AAS). The manual number of visitors can be considered a time-consuming process. Or the teacher may miss someone or the student may answer several times when a friend is not present. Therefore, this problem arises when thinking about the traditional process of participating in the classroom. To solve all these problems, go to the Auto-Existence System (AAS). You can also see whether students are sleeping or awake during the lecture. It can also be held at exam meetings to ensure the presence of students. Student presence can be determined by entering faces into a high-resolution monitor video streaming service. Therefore, it is highly reliable for the machine to understand the presence of all students in the classroom. Two common methods of human face recognition techniques are distinctive approaches and brightness approaches..

The Feature-based approach also known as local face recognition system, used in pointing the key features of the face like eyes, ears, nose, mouth, edges, etc., whereas the brightness-based approach also termed as the global face recognition system, used in recognizing all the parts of the image.



Fig 1. The operate process of face recognition system

According to the above process, facial recognition is not an easy task to do. There are several methods and algorithm needed to implement with face recognition. In [6] has implemented the system to recognize the human face with LBP(Local Binary Pattern) and using SVM(Support Vector Machine) to find the similarities of the images stored in the database with the acquired image snap by the camera inside the classroom.

FACE RECOGNITION TECHNIQUES

Principal Component Analysis (PCA):

PCA was known as a reduction in dimensions and a selection of characteristics. PCAs where the number of key components of the data are used are multidimensional. Human identification systems using principal component analysis were initially developed by Türkiye and Pentland [13]. This solved facial recognition in two dimensions, not three dimension geometry. Since both the image constructed by PCA and the basic vectors have the same dimension [14] and reconstruction, we ran the human faces in [15] to resolve the call image in a large database. In recent developments in automatic face recognition, distinctive extraction has become important for extracting features such as the nose, eyes, and mouth. Furthermore, the main purpose of PCA is to keep the original information of the data to minimize original loss information and improve facial analysis. The main component analysis is primarily of one's face, limited to size reduction [16]. [17] introduced the possibility of calculating discriminatory advertising for PCA using attractive algorithms.

Geometric Approach:

This approach is used at geometry points on human surfaces. Many characteristics of the geometric approach were implemented. [7] Geometric approach used to improve the accuracy of the system when images contain complex backgrounds.

LITERATURE REVIEW

The main purpose of this work audit is to consider the systems that find solutions offered by other authors and propose them. Equipped with two cameras with class walls, the architecture of the system is simple. The first is a recording camera in which the image students are recorded in the class, and the second is a sensor camera that gets the student's seat within the class, and the camera captures the student's images. The system compares photos and camera images that record faces in a database, making perfect participation. The system installed the camera without disturbing the camera, took photos in the classroom, and compared the faces extracted from the camera's images with the faces in the system. Also Haar-Klassifierers to capture photos from the camera. The camera's facial festival captivates the grayscale and subtraction of photos. The images are then transferred to the server and processed later. Enquiries will be added to the database to match new facts. The first step opens with a request, open the camera, extract the front and take a photo. The next step is to recognize faces with training data and project the extracted faces into the main component analysis. The final step shows the next face where the photo was taken. Apart from that, this post-extracted photo, which adds a new face to the database, is a frontal image and performs the hair cassade method to perform the algorithm for main component analysis. The final step is to save the information in a Face XML file. The system focuses on algorithms to improve facial recognition through recorded images and videos. A system in which objects can be extracted into the nose of the face with matrab using main component analysis (PCA). System [7] is intended to fix issues with existence marking systems, such as time-reducing solutions. The results of the experiment show that the system can recognize the dark background or differences in classroom faces. The author's goal is to solve traditional existence marking systems and time-consuming solutions. Implementing a system using main component analysis performs extraction, identify similarities in the face database, and record images. Artificial neuronal networks are used to solve problems with input data or to learn from input data and expected values. In the system implemented by the author, back-prevention algorithms are used and run in this system in combination with mathematical functions. The results show that the system can be recognized in another environment. The camera must have a front desk set up to get a full grasp of the faces of students in the class. The first phase after the camera is recorded. The recorded images were transferred to the system as input. Absorbing images from the camera may be equipped with darkness or brightness. This requires improvements to be made, such as: The next step, normalization of the histogram, is used in this system to remove contrast in the image. It's easy to see when students are sitting in the back row. If the camera is a high resolution camera, the median of the filter is used to remove noise from the image, but sometimes it contains noise. The authors also implement a skin classification that changes the entire pixel in black, except that the pixels are close to the skin.

[1] Existence System Using Face Recognition: Samridhi Dev, Tushar Patnaikb (2020) In this article, the system was tested with three different algorithms, from which the KNN algorithm with 99.27% accuracy was better. The system was tested under a variety of conditions, including lighting, head movement, representation, and removal of students from the camera. The system is expected, even if the image shows a face with a beard and glasses and no beards or glasses. The proposed system was great at recognizing faces with differences over the past two years.Data Record Creation and Training C. Facial Recognition and Update of Visitors

[2]FARC-CNN-Based Efficient Face Recognition Techniques: Sharma S, Karthikeyan Shanmugasundaram, and Sathees Kumar Ramasamy (2016) used distinctive, distinctive models from neural networks. This model has the overall label characteristics of the facial recognition system. The test images are validated against these models and provide the maximum probability value between the name and the claim that the person is a person. Farec takes 20 epochs to a convergent learning rate of 0.01, creating a 96% accuracy and an incorrect acceptance rate of 0.1% (1-100) in BRGC. The training loss is significantly reduced to 0, as before the previous epoch. Figures 9 and 10 show the convergence and accuracy of Farec. Enhanced. This enlarges the initial data record and improves overall accuracy. Analyzing images stored in the database during detection period revealed that light conditions had an impact on the recognition process. Most of the incorrect photos were exposed to sunlight while the door was open. This can be corrected by applying gradient transformation to the image. A small number of photos affected by unknown causes of noise were correctly predicted. Total accuracy can be

improved by improving what the model predicts with high accuracy by using automatic reprocessing of embedded depth CNN at time intervals along with newly collected images. Of the seven people to measure the accuracy of the system. The Extract() function shows an example - Binärbild saved with the help of Paulus' memory frames. Results show that increasing face corners reduce the camera in terms of face recognition and detection rates and detection rates. In introducing entry and exit times, the author plans to develop a university presence management system based on facial recognition technology. The presence of the system is collected by the system through constant observations at the entrance and exit points. The results of the first experiment were better processed with performance. This system was developed primarily for facial recognition of images or video frames.

CONCLUSION

Analyzing various methods shows that this paper can achieve the goal of analyzing methods such as capacity, throughput, and accuracy of the entire system. Analysis of this work shows that PCA algorithms are highly effective in a wide range of databases. After analysis in all papers, PCA is superior in the presence management system for facial recognition, a technique that ensures presence and replaces manual presence systems, spends time and contributes to the folding of neuronal networks in the presence management system with the help of facial recognition. Future work will require system accuracy to be resolved by incorporating main component analysis into neural networks using folding components. The next research will maintain excellent generalization skills. In [27] has been integrated ANN with PCA to solved a blocking issued of attendance management system using face recognition. However, it still has issues with performance and the accuracy of the system to recognize a human face. In the next research work will conduct fast PCA with back-pro Back-Propagation to resolved that problem.

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