FACE RECOGNITION ATTENDANCE SYSTEM BASED ON REAL-TIME VIDEO PROCESSING

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ABSTRACT

With the onset of the big data era in the world and the increasing economic value of facial re cognition technology, the future of facial recognition technology is very bright and has a grea t economic potential. This article is designed to create a facial recognition session based on a real video game. This article basically lays out four guidelines to consider: the authenticity of facial recognition authentication at login, the security of facial recognition participation during withdrawal, the value of face verification of participation over time. Use of video processing and Interface settings in the facial recognition system for actual video processing. By analyzing the nature of these problems, the idea of coming together as facial recognition technology was proposed.

Keywords: Video, Facial Recognition Technology, Facial Recognition, Participation, Video Recognition.

I.   INTRODUCTION

In this age of internet boom, computer technology has become involved in many aspects of people's lives and work. The places where people come into contact with computers are expanding. The frequency of people using computers is also increasing. It has a wide application area due to its high understanding of innovation, which is one of the most challenging jobs in this field. Facial recognition, which is an important sign for people to distinguish between people, has gradually entered people's lives. Facial recognition is a combination of artificial intelligence and computers. It has become the most difficult issue in this field due to huge competition and wide demand. The author who reviewed this article an d approved it for publication is LuiZhihan. In re cent years, facial recognition application technology has developed rapidly around the world a s a computer security technology, and this technology is attracting more attention, especially to day when criminals make malicious attacks. Facial recognition has many applications in public safety, public works, home entertainment, and other projects In most cases, the plumbing business needs to recruit staff who become an imp ortant part of the company. However, unnecessary mistakes often occur when creating the on boarding process. Let's take the current finger print participation as an example, Studies have shown that the error in fingerprint attendance is about 5%,and the fingerprint will not be printed, which has a good impact on Attendance work, especially where there are a large number of participants is likely to cause congestion. However, in the attendance card, there is a situation where employees draw the card for others, making time attendance target. Compared with the two participating systems, facial recognition is more accurate and stable because facial recognition has more details and is more accurate than other systems. Highly advanced and less stressful establishing facial recognition engagement with real video games is essential for the development of the enterprise and has a positive impact on the future development of the enterprise. This article is designed to create a facial recognitio n session based on a real video game. In this experiment, four investigation experiments were carried out, the accuracy rate of the face recognition system in actual check in, the stability of the face recognition time and attendance system with realtime video processing; analysis of the skip rate of face recognition attendance system using real time video processing; interface settings of face recognition attendance system using realtime video processing. The experimental result s prove that the time and attendance system ac hieves the expected time and attendance result s through face recognition technology and with the help of a computer, which fully reflects the feasibility design of the overall algorithm. The students who completed the attendance sign in system quickly completed the tasks, got rid o f the complicated sign of roll call, and soon realized the sign of

operation and function. The future system time and the form of attendance system conversion have made tremendous innovations, greatly improving the attendance rate and the reliability of face recognition technology. It i s worthy of further exploration and realization b y our scientist.

II.   PROPOSED METHOD

Facial recognition is the core of the entire authentication process. Facial recognition is a computer vision technology that analyzes facial information for identification purposes. In general, face recognition is divided into two parts, face recognition and face matching recognition. Facial recognition is based on human facial features and accesses facial images or video streams. First of all, it is determined whether there is a human face, if there is a human face, the position and size of each face and the location information of the ma in face are given further. Based on this information, the individual features contained in each face are further extracted and compared to known faces to identify the identity of each face Facial recognition is a biometric technology that mainly consists of four parts: facial image collection, facial image preprocessing, facial image feature ex traction, matching and complex combinations, a s well as camera hardware, network lines and computer equipment. Calculation method.

Retrieve and preview facial information from camera equipment. Face Test. The main purpose o f face detection is to collect data to determine whether a face is present in the image, determine the size and position of the image, and classify t he image as an adult face. The final step is to collect the face and advance the facial data to the device's camera. Face Test. The main purpose of f ace detection is to collect data to determine whether a face is present in the image, determine the size and position of the image, and classify the image as an adult face. The last link is the face recognition, Remove facial data and image data to determine if it is in storage. It contains person al information, if any, otherwise consent will not be obtained. However, some minor problems of ten arise when using this method for facial rem oval. The properties of these organs have been studied over time. Geometric features were first used to identify and describe the profile of the human face. It determines a number of specific points based on the contours of the person's side and then provides a set of values for analysis, such as angles and distances relative to those points. Its advantage is that it uses simple geometric data, so the time cost of storage and distribution is low, and it can also be used in cases where image recognition is low; It is not sensitive to changes in appearance.

a) SUBSPACE ANALYSIS METHOD

The subspace analysis method uses spatial trans formation to map facial data into a subspace to obtain the dimension of facial data. This means that facial data becomes too large to be easily calculated, and then the data is reduced and separated. Different subspace analysis methods use different methods to obtain different subspaces. Common subspace analysis methods for face recognition include: key point analysis, line separation analysis, individual point analysis, etc.

b) NEURAL NETWORK METHOD

Neural networks are a widely used method in membrane analysis. The principle is to use large numbers of simple computers to create hierarchical structures.

Main face recognition methods. simple unit can only solve simple calculations, but the system composed of units in complex structures can be a complicated question. The neural network algorithm has also achieved good results in face recognition. For example, commonly used BP networks, self organizing recognize all faces. Although neural networks have some advantages in face recognition, they also have considerable defects. The structure of neural networks is huge and complex and their training requires a huge sample library Training usually takes days or months. Not fast enough. For this reason, neural networks are not often used in face recognition applications.

c) SUPPORT VECTOR MACHINE (SVM) METHOD

Support vector machine is a center of research i n the field of pattern recognition. The principle o f this algorithm is to use the model to form a grid in high space, select points close to the boundary of two types of model points as support vectors, and use the vectors to make decisions. Finally , the purpose of classification and description is achieved. The high space projection method makes it possible to solve many problems that are difficult to separate linearly in state space. However, support vector machines also have short comings. First

of all, support vector machine is a two class algorithm. Although some methods can be used to solve many classification problems, their effectiveness often decreases. Second, the support vector machine needs to be high space projection, which requires the support of kernel functions, but choosing kernel functions is indeed a lot of trouble. Finally, although support vector machines can classify independently, the effect of directly classifying faces is not good, and often feature extraction is required for faces. The dimensionality reduction process is performed before recognition, and the basic flow is.

d) VIDEO IMAGE RECOGNITIONSYSTEM

Face detection system is used to find and separate face image from the image; feature extraction technology extracts an amount of information that can characterize the facial image, create features and store them in feature files. Facial recognition process: face embedding and image processing; feature extraction and selection; search and confirm images and return VOV 8, 2020 159145 H. Yang Xiaohan: Facial recognition as a real time video game. Attendance System Identification Results. First create a face image file of the face. That is, use the camera to record the facial image of the face or take a photo of the face to create a face image and store this facial data to create a facial feature. Now find a face. That is, by us in the facial image captured by the existing camera or by taking a photo for input, the beautiful face c ode is created from the existing facial data. Com pare with existing inventory of beautiful face encodings and data. So now the facial texture coding is given and compared to the facial texture coding in the list. The "face coding" method mentioned above works based on the basic features of human faces. This facial coding is resistant to light, skin color, beard, hair, glasses, expression and body changes, is reliable and can identify people among millions of people. Face recognition can b e done completely, continuously and in real time using ordinary image processing equipment. The video recognition system generally consists of four parts: login module, authentication module, login module and background check Use the school system as follows an example, the functions of each module are as follows

1) The login module is where the lecturer or background administrator logs in with an account and password to view attendance information.

2) The main function of the recognition module is to receive a face picture, call the system application programming interface (Application Programming Interface, API) to perform face recognition on the picture, and obtain an identification code that uniquely determines the picture.

3) The check-in module receives the identification code obtained in the identification module and compares it with the student information in the database to find and confirm the student information; by querying the current time and the schedule information in the database, the current course information is obtained. After obtaining the student and course information, it is logical to determine whether the student has checked in for this class, if it has been checked in, ignore it; if it has not been checked in, add the check in information to the database check in table. The module will return check-in information, including: whether the check-in is successful; the student's name; the student's student ID; the course that is checked in; if the check-in is unsuccessful, what is the reason. 4) The background management module is responsible for the background administrator, which mainly includes the functions of counting sign-in information, entering or deleting student information, etc.

e) BASIC FACE RECOGNITION ALGORITHM

When designing a system to select a face recognition algorithm, we have to consider the following factors: recognition rate, algorithm robustness, and matching time To sum up, the system selects Gabor features plus Fisher based discriminant analysis method based on orthogonal basis to become a linear discrimination method Face image feature representation is a key part in face recognition, and good feature representation can improve the robustness of image matching. Gabor wavelet feature description method is a comprehensive method that combines gray and local descriptions. It has the advantages of gray-based and feature-based methods Gabor kernel definition of wavelet transform 9j(xE) D kE2 j σ2 exp(- kE2 j xE2 2σ2)[exp(ikEjxE) - exp(-σ22)] δ(Y; Fk0) D min δ(Y; Fk0); Y 2 'k (12) Among them, δ is judged as the distance. If the distance between Y and F0 k is smaller than the distance between the two face images in class Fk0, then Y and Fk0 can be regarded 159146 VOLUME 8, 2020 H. Yang, X. Han: Face Recognition Attendance System Based on Real-Time Video Processing

f) BASIC MODULE OF FACE RECOGNITION ATTENDANCE SYSTEM BASED ON REAL-TIME VIDEO PROCESSING

The complete attendance system consists of a combination of multiple modules, each of which performs different functions. In order to reduce the complexity of the program and facilitate the reuse of codes, it is conducive to maintain and manage the entire system. The design of the face recognition time and attendance system in this system mainly includes several modules of video acquisition terminal, cable transmission module, data storage.

III.   EXPERIMENTS

A. EXPERIMENTAL SETUP

1) EXPERIMENTAL BACKGROUND

In order to deeply study the application of face recognition attendance system for real-time video processing, from the accuracy of actual recognition of face recognition system, the stability of background application system of face recognition attendance system, the face recognition system faces some problems; the development status of the role played by the face recognition system actual check-in, the factors restricting the development, and the difficulties faced by the development are considered, and many problems are found.

2) EXPERIMENT SETUP PROCESS

The experiment sets up a control group and an experimental group, the control group uses traditional fingerprint check-in, and the experimental group uses a real-time video processing face recognition attendance system. Choose two universities from a province, choose the same number of students for the experiment, collect, count and analyze the experiment, analyze the application space, development prospects of the face recognition system in the actual check-in, and the face recognition system in some problems with the actual checkin(1)Accuracy rate of face recognition system in actual check-in The face recognition attendance system using real-time video processing is used to count the sign-in rates of students from two colleges and universities, and to compare and analyze the sign-on accuracy rate of the face recognition attendance system using real-time video processing. (2)The stability of face recognition attendance system with realtime video processing Taking the manual punch card as the control group, the face recognition attendance system using real-time video processing is used for the check-in statistics, and the number of check-in punch cards is used as the main observation parameter to detect the stability of the face recognition attendance system.(3) Analysis of the truancy rate of face recognition attendance system using real-time video processing Taking the manual punch card as the control group, and using the real-time video processing face recognition attendance system to perform real-time check-in statistics, observe the students' skip-rate rate of the two methods.(4) Interface settings of face recognition attendance system using real-time video processing By identifying the student's face as the attendance interface, the successful student attendance and time information will be displayed on the screen. By selecting face detection and recognition, the video images of the attendance students can be described by the face recognition attendance system multi-person video.

B. DATABASE DESIGN

This system uses a variety of popular programming languages-Python (Interpretive Language), Java, C CC and other languages to develop. Python is used for real-time video data collection and face recognition processing. C CC is used to complete the related system running components such as file operations and client running interface design. Java is used to build a face recognition WEB platform service. Combined with the third-party library Open CV to realize the writing of face recognition module, OpenCV provides rich visual processing and image processing algorithms to analyze and process the facial features captured by the classroom camera. The system is divided into three modules: front-end operation, real-time video face recognition module, and background data management.

IV.   DISCUSSION

Figure 1. According to the experimental results, the accuracy rate of face recognition in the classroom video of the two colleges is currently high, and the accuracy rate of face recognition in the college video is about 82%. About 15% of the failed card punches due to video blur and other reasons, About 3% of the staff failed to punch in, it can be seen from these data that the accuracy rate of the video face recognition system is relatively high.
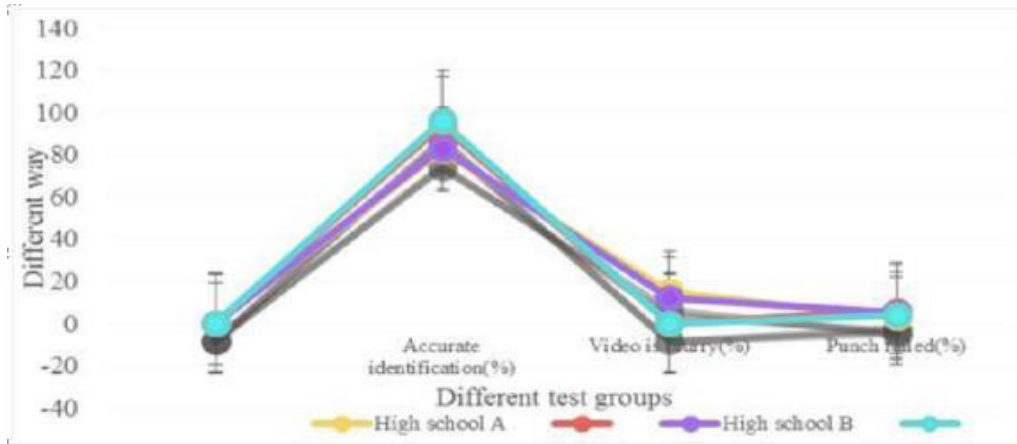
FIGURE 1. Video face recognition accuracy.

B. STABILIT

The face recognition attendance system for real-time video processing performs video punching every two hours. Comparing the data of the face recognition attendance system and manual fingerprint punching, the sign-in success is 1 and the failure is 0. The data collection results are shown in Table 2 and Figure 4. An error occurs in the face recognition attendance system from 7 am to 9 am; from 13 noon to 21 pm, the face recognition attendance system and manual fingerprint punch card can correctly identify the check-in. The experimental results show that the length of time when the smart machine is turned on may bring some experimental errors, indicating that the human-machine interactive testing instrument needs to be pre-powered on for two to four hours before the accuracy of the testing data can be guaranteed. From the amount of change in Table 4 and Figure 6, it can be seen that by recognizing the student's face as the attendance interface, the successful attendance and time information of the confirmed student is displayed on the screen. By selecting face detection and recognition, the video images of the attendance students can be described by the face recognition attendance system multi-person video. Compared with the traditional punch card signing, this method greatly improves Attendance and these methods have a common shortcoming, fraud will occur, thereby increasing the rate of absenteeism. This repeated phenomenon not only recognition attendance system using real-time video processing. By analyzing the situation of these problems, the concept of attendance system based on face recognition technology is proposed, and the research on face recognition attendance system based on real-time video processing is carried out. Research data shows that the accuracy of the video face recognition system is about 82%. The face recognition time attendance system and manual fingerprint punching are more stable and correctly identify check-ins, and the rate of skipping classes is significantly reduced compared with the control group, only about 13%. Compared with the control group, the efficiency is greatly improved, which can prevent students from leaving early and skipping classes. (3) The attendance system realizes the expected attendance results through face recognition technology with the help of a computer, which fully reflects the feasibility design of the overall algorithm. The students who have completed the attendance sign-in system quickly completed the tasks, got rid of the complicated sign of roll call, and soon realized the sign of operation and function. The system has made tremendous innovations, greatly improving the attendance rate and the VOLUME 8, 2020 159149 H. Yang, X. Han: Face Recognition Attendance System Based on Real-Time Video Processing reliability of face recognition technology. It is worthy of further exploration and realization by our scientists. ineffective. Participation with this method has the common disadvantage that fraud will be detected and therefore increase the attrition rate.
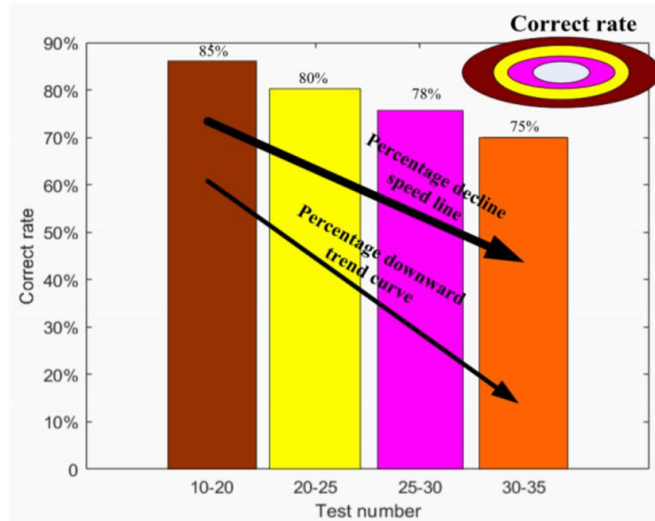
Figure 2. Test number and accuracy rate chart

This persistent phenomenon not only affects the psychology and physiology of students, but also disrupts the normal teaching schedule in the university and hinders the quality of teaching. At the same time, there will be a very awkward learning environment and the formation of university spirit and discipline. This paper mainly identifies four issues to be considered: the accuracy of face recognition system in real-world testing, the stability of face recognition system and real-time video processing, and the durability of face recognition. The interface settings of real-time video processing facial recognition systems are difficult to analyze. By analyzing the situation of this problem, facial recognition technology based on real video processing and the concept of Teresearchon's facial recognition based engagement system were realized. Research data shows that the accuracy of the video face recognition system is about 82%. The time attendance system of face and manual fingerprint recognition is more stable and correctly identifies check marks, and the passing grade rate is only 13% compared to the control group. Compared to the control group, there is a significant increase in efficiency, which can prevent students from leaving early and skipping classes.

(3) The participation system understands the participant's expected results through computer aided intervention technology that fully reflects the overall algorithm design. Students who have completed the entry system for participation complete tasks faster, avoid the complexity of pressing on cues, and quickly understand cues and cues to work.

V.   CONCLUSION

Strengthening student governance has become important in today's society due to the increasing concern about absence management. However, many students still rely on traditional methods such as paper signatures or teacher orders to attend. As technological progress, some colleges and universities have begun to adopt new methods such as fingerprint recognition and smart attendance systems. Despite this effort, this method has limited effectiveness in encouraging participation because it increases the rate of fraud and distractions, This chronic problem not only affects the psychological and physical health of students, but also disrupts the regular curriculum and harms the quality of education. It creates an unhealthy learning environment and hinders the development of university spirit and discipline. This paper focuses on four main issues: accuracy and stability of real-time face recognition systems, real-time video processing, and persistence of face recognition. By analyzing the situation, this study successfully implemented face recognition technology based on real-time video processing and Teresearchon's face recognition-based interaction system.

VI.   REFERENCES

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