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Study on the Application of Portrait Identification Technology in China's Entry and Exit Management

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***Abstract*—Portrait recognition technology is widely used in China for its unique features of concealment, speed and reliability. This paper studies on the application of portrait recognition technology in the entry and exit management in China.On the basis of summarizing the principle, characteristics and working process of portrait recognition technology, the application status of this technology in the entry and exit management of China is analyzed, and the prospect of future application is proposed.The study of this paper has certain practical significance to improve the security management level of our country's entry and exit.**

Keywords—portrait recognition, the entry and exit .management, application

Portrait recognition technology is widely used in the fields of file management, security verification, crime detection, import and export management, man-machine interaction and financial industry because of its high recognition, low cost of use and convenient sampling method [1].With the continuous development of China's big data era and information technology, portrait recognition technology will have a wider application.This paper studies on the application of portrait recognition technology in the entry and exit management in China.The study of this paper has certain practical significance to improve the security management level of our country's entry and exit.

I. Application principle and characteristics of portrait recognition technology

The application of portrait recognition technology is mainly based on the powerful information technology. The computer is used to identify various features of portrait, and the real identity of the identified object is determined through the check calculation of relevant algorithms [2].The comparison between portrait recognition technology and other biometric identification technology is shown in table 1.

Table 1 Comparison of portrait recognition technology and other biometric identification techniques

Comparative project	Portrait recognition	Fingerprint recognition	Retina recognition	Iris recognition
Inspection Method Need to contact	No	Yes	No	No
need Coordinator of the testee	No	Yes	Yes	Yes
Acquisition rate	fastest	fast	slow	faster
Copy or not	No	When static	No	No
Reliability	High	High	Highest	Highest
Convenient to use,	Most convenient	convenient	inconvenient	More convenient
Extensive application	widest	wide	Not wide	wider

From the comparison results in the table, it can be seen that portrait recognition technology mainly has the following prominent features:

1. Portrait recognition technology does not need to contact the detection object or cooperate with the detection object. Therefore, it is highly concealed.

2. Portrait recognition technology has the fastest data acquisition rate, low cost of equipment and facilities, and is very convenient and quick to use.

3. Portrait is not easy to copy, which makes portrait recognition technology highly reliable and strong traceability.

II. The application workflow of portrait identification technology in China's entry and exit management

The portrait recognition system used in China's entry and exit management mainly includes front-end data acquisition system, image data processing system and data management query system.Front-end data acquisition system is mainly responsible for to be defined as characteristics of data collection, to make the image data integrity and to provide reliable analysis data, to the follow-up system tested must not wear mask, the tested environment of bright light, like shooting Angle is correct, these are for the application of this technology is put forward very high requirements.The image data processing system mainly optimizes the image data collected by the front end and extracts the main distinguishing features of portrait, so as to compare it with standard samples in the database.Data management query system is to compare and query the optimized data

with the standard sample in the database, and output the result after confirmation.The workflow of applying portrait recognition technology is shown in figure 1.

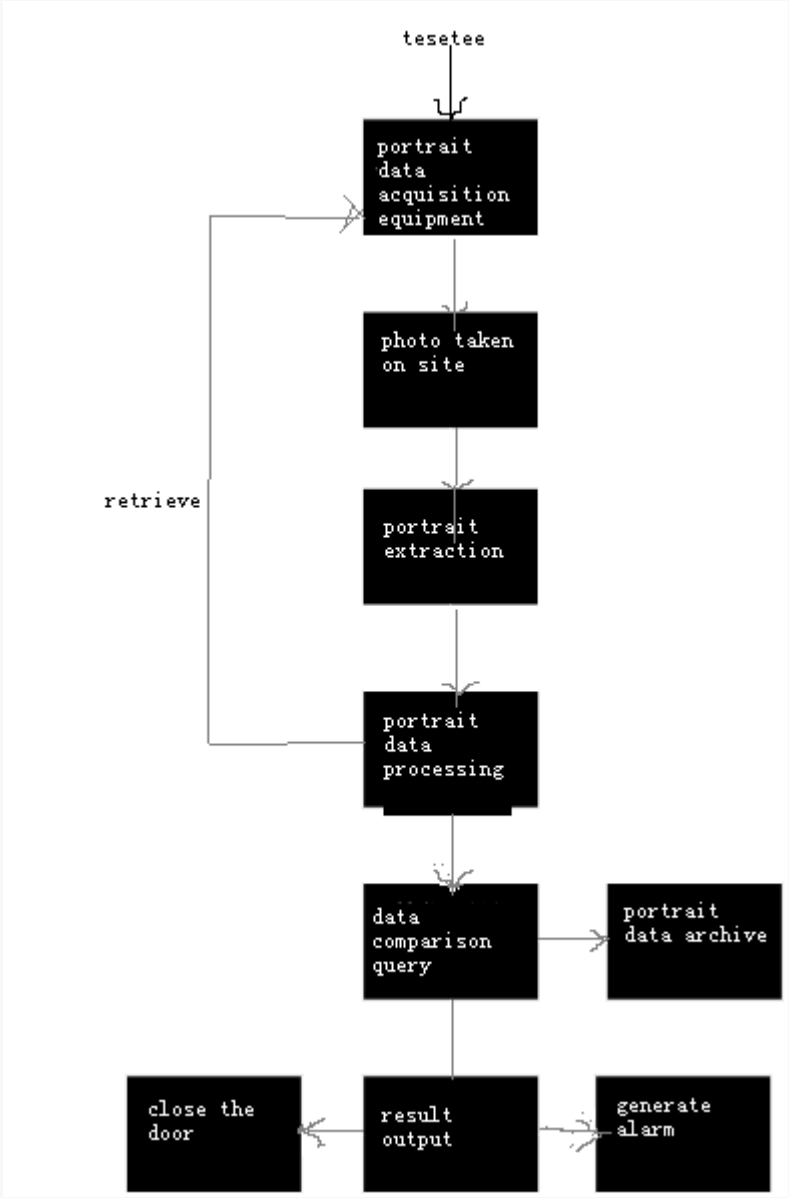

FIG. 1 flowchart of the application of portrait recognition technology

III. Application status of portrait identification technology in China's entry and exit management

Portrait identification technology is applied in the entry and exit management of China to verify the entry and exit personnel with the data support of national identity information database, confirm the accurate identity information of the entry and exit personnel, and provide assistance to the investigation work of national government departments, especially the public security system.The portrait recognition system in the entry and exit department is highly secretive, easy to use and reliable in data, providing strong technical support for the smooth completion of the detection of various important cases and major cases and the capture of cross-border criminals.

Portrait recognition technology has also encountered some bottlenecks and difficulties in the process of its wide application in access management in China. It is highlighted in the low accuracy and qualification rate of human face data capture and recognition in portrait recognition system. The main reasons are analyzed as follows:

1. China's entry and exit environment is complex, with too much human flow and too many influencing factors (such as facial expressions, gestures, and ambient light, etc.), and the portrait recognition system cannot capture qualified portraits that fully meet the requirements of data analysis due to environmental impacts.In particular, portrait identification is used to screen or catch criminals, and it is difficult to catch qualified people without being detected by the test subjects.

2. Limited by the technical conditions of the software and hardware of portrait recognition technology, the number of feature vectors that can be accurately identified by the system is limited, resulting in low accuracy of identification.In particular, the data in the database of criminal fugitives are often only a photo of a human face or even a sketch image, which is difficult to compare with the images captured in reality.

3, Portrait recognition technology research and development work in China mainly rely on the professional information technology personnel, although their r&d technical level is higher, but the lack of work experience in the field of public security, especially at the scene of the entry and exit this special recognition technology environment how to effectively apply the portrait, it remains to be a more professional development and research.Although the field system users have professional background of the public security system, they lack more professional information technology knowledge.All of above seriously affect the application scope and depth of portrait identification technology in our country's entry and exit management.

IV. Application prospect of portrait identification technology in China's entry and exit management

According to the application status of portrait recognition technology in China's entry and exit management, based on the analysis of existing problems and causes, the application of portrait recognition technology is prospected as follows:

A. Strengthen the Research and development of the Software and Hardware of Portrait Recognition Technology

The improvement of software and hardware technology is the foundation of effective application of portrait recognition technology. Only with reliable software technology and hardware facilities, can effective portrait capture and accurate face recognition be carried out in the complex environment of entry and exit.In terms of software, image data processing system functions can be optimized to improve the image data processing capacity that does not meet the requirements. For example, under the support of 3D technology, portrait reconstruction can be conducted by combining one, multiple or video fragments with lower resolution images, so as to improve the recognition rate of portrait recognition technology.In terms of hardware, we can start from the front-end data acquisition system and improve the qualification rate and accuracy of portrait data collection by developing and using advanced photography and camera equipment with higher imaging clarity.With the continuous development of information technology in China, the software and hardware of portrait recognition technology will be further developed, which lays a solid foundation for the further promotion and application of this technology in the entry and exit management in China.

B. Strengthen the Cultivation of Professional and Technical Personnel in Multiple Fields

The cultivation and application of portrait recognition technology provides strong human resource support for its wide and deep application.In the future, the professional personnel of portrait recognition technology should be professional talents in multiple fields. They should not only have professional information technology knowledge, but also have rich experience in the management of the entry-exit department, and even have certain abilities of handling cases and catching criminals.The cultivation of comprehensive professional and technical personnel in multiple fields can make the research and development of portrait recognition technology pay more attention to the application of the special environment in the entry and exit of China, and also make the use of portrait recognition technology more perfect to reflect the professionalism and efficiency of information technology.The cultivation of professional technical personnel in multiple fields can be carried out from two directions, and suitable cultivation methods can be selected according to the actual situation.One is to select highly qualified professional it technicians to practice in the immigration department and participate in case investigation, so as to enrich their experience in case handling;Another is to select highly qualified exit-entry management personnel and even public security personnel to study informatization technology, so as to enrich their experience in the research and development of informatization technology.

C. Strengthen the Combination of Portrait Recognition Technology and Other Technologies

Due to various factors, the application of portrait recognition technology in China's entry and exit management still has some limitations. No matter how the technology develops, there will be some problems in dealing with the entry and exit site with complex environment and frequent situations.Organic combination with other identification technology can solve some practical problems to some extent, including the identification technology is comparatively mature development, such as fingerprint identification technology, the DNA identification technology, speech recognition technology, the retina or iris recognition technology, etc., can also use more advanced spatial geometry Angle motion recognition technology, three-dimensional space of human behavior recognition technology, etc.The organic combination of multiple recognition technologies can make up for each other's deficiencies, and more clearly, rapidly and accurately identify the various characteristics of the tested, so as to complete the accurate collection and accurate processing of the test data in the relatively complex environment of exit and entry.

V. CONCLUSION

Portrait recognition technology has a wide range of application due to its unique features of concealment, speed and reliability.By analyzing the application status of portrait recognition technology in the field of entry and exit management in China, it is found that the accuracy and failure rate of face data capture and recognition are still existed.The analysis of the reasons is mainly due to the complex environment of the entry-exit department, the limitations of software and hardware technology and the limited professional ability of the r&d and application personnel.Based on the analysis of problems, the future application of portrait recognition technology is forecasted, and it is an effective way to effectively promote the application of this technology in the entry and exit management of China to strengthen the research and development of software and hardware technology, cultivate multi-field professional talents and organically combine with other identification technologies.

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