Design and Implementation of Access Control System for Face Recognition Human Card Comparison Terminal

Liu Yi'ou

Xi'an International University, Xi'an, Shaanxi, China

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Abstract: with the Continuous Improvement of People's Living Standards, the Awareness of National Security Has Been Gradually Enhanced, and Potential Safety Hazards Have Been Widely Spread. as a Part of the Whole Security System, Access Control System is a Part of the Security Field. in Addition, with the Rapid Development of Computer Technology, Face Recognition Technology Has Been Supported by the Most r &Amp; d Institutions in the Field of Security. Face is a Unique Biological Feature. Facial Recognition Technology Can Achieve Identity Recognition by Collecting Facial Images and Extracting Facial Features from Images. Because of Its Simple Operation and Intuitive Results, Face Recognition Technology is Widely Used in Information Security, Access Control and Other Fields. the Face Recognition Access Control System Designed and Installed in This Paper is Mainly for Small-Scale Office and Home Applications.

1. Introduction

With the Rapid Development of Social Economy and the Continuous Improvement of People's Living Standards, People's Awareness of Security is Also Gradually Improving. as a Result, People Have Higher Requirements for Security Defense System. in Order to Design a More Secure Security System and Improve the Residents' Sense of Security, the New Technology Has Attracted Much Attention in the Field of Security Research. as an Important Part of the Whole Security System Design, Access Control System Has Won the Favor of Most Users Because of Its Intelligent and Automatic Functions.

2. Research, Development and Status At Home and Abroad

2.1 Development of Face Recognition Technology

Face Recognition Research, for the Sake of Journal Natural Recognition, is Back to the Two Articles of Galton in 1888 and 1910. Human Analysis of Face Recognition Ability, Using the Number Used to Represent the Characteristics of Both Sides of the Face, But the Research At That Time Did Not Include Automatic Face Recognition. in 1965, the Technical Report Published by Chang and Brudsoe of Pananamic Research Company Started the Research on Automatic Face Recognition (Afr) by Scholars in the Past 50 Years. Since 1990, a Large Number of Papers on Face Recognition Have Appeared. Secondly, According to the Different Research Contents of Each Period, from 1964 to 1990, the Development of Facial Recognition Can Be Roughly Divided into Three Stages. At This Stage, the Research of Face Recognition is Regarded as a General Problem of Pattern Recognition, Which is Adopted According to the Geometric Structure Features of the Face. as the Initial Stage of Research, This Stage Has Not Achieved Many Important Results. the Time Interval between 1991 and 1997 Was Relatively Short, But It Reached the Climax of Research and Achieved Fruitful Results. after 1998[1]. Facial Recognition Research Continues to Be Invested, Enthusiastically Accepted by Many Researchers, and Supported by Most Funds. the Mainstream Recognition Technology, Lighting, Posture, or User's Mistake Match Caused Change Sensitivity, Therefore, the Focus of Face Recognition Research is That Lighting and Posture, Object Inconsistency, Large-Scale Face Database and Other Non Ideal Acquisition Conditions[2]. At the Same Time, the Trend of Technology Development is Also Changing. More Important Are

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Statistical Learning Theory, Nonlinear Modeling, Face Modeling Based on 3d Model, Recognition Method, Boosting Learning Technology.

2.2 Research At Home and Abroad

Since 1960s, face recognition has been studied in foreign countries, so many researches have been carried out and many face recognition algorithms have been put forward. At present, most of the researches are aimed at improving the performance and efficiency of the algorithm. As a research hotspot in the field of image engineering, more and more research groups put forward face recognition technology[3]. Almost all famous universities of science and technology have their own research groups in this field, such as MIT, Yale University and UCLA. In addition, in this field of research, well-known IT industry enterprises are also very important to commercialize research results. For example, IBM uses an identity based face it system to monitor whether a laptop user is the same person. Now, many aspects such as identity authentication and access control are using the system. The face viewfinder system made by viisage is successful[4]. It can be used in driver's license and various visa verification systems, and combined with the monitoring system of access control system. The company's first face recognition software was tested on site by the international computer security association. Domestic research on face recognition is later than abroad[5]. However, at present, Tsinghua University, Chinese Academy of Sciences, Zhejiang University, Harbin University of technology and other domestic universities and research teams have participated in the field of face recognition research, and achieved outstanding theoretical research results. Moreover, their academic level is close to the international advanced level. Zhou Zhihua proposed that neural network integration can be used in multi view face recognition. By analyzing the facial features obtained from multi view features, the recognition accuracy can be greatly improved. A new face recognition method based on SVD and data fusion is proposed. Facial features based on texture feature distribution and deformation model extraction method not only catch up with advanced international level in theoretical research, but also make great progress in commercialization of research results. For example, Shanghai Yinchen Intelligent Identification Technology Co[6]. Ltd. is the first enterprise specialized in the research and development of biometric technology in China, and the only basic company to realize industrialization in the field of biometrics in China.

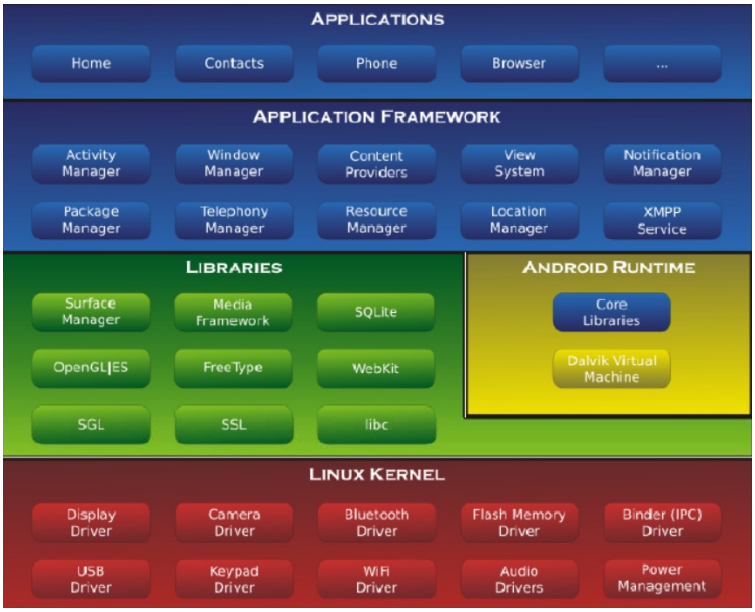

Fig.1 Access Control System Architecture

According to the Tianmu series of developed face recognition products, the company has been well used in the military and civil fields, but this series of products, developed in the Institute of computing technology, Chinese Academy of Sciences, is formed on the basis of visionics . Therefore, it does not have independent intellectual property rights[7]. The Institute of computing

technology of Chinese Academy of Sciences and Yinchen. Com has completely independent intellectual property rights. The algorithm can be the target of product and system development. The Institute of face recognition research and development has established the “core technology system of face detection and recognition” which is jointly developed according to the certification. The automatic certification is carried out at the 16th CPC National Congress[8]. The 2008 Beijing Olympic Games opened up the application of face recognition technology in the Olympic Games. The system is independently developed by the Institute of automation, Chinese Academy of Sciences, and has completely independent intellectual property rights. During the 2010 Shanghai World Expo, the excellent appearance of face recognition access control system is protection also reflects the concept of “security and technology”[9]. On September 5, 2013, China International Financial Expo released the face painting payment system. The system is based on the biomedical cloud finance platform independently developed by Tiancheng Shengye[10]. It combines the existing payment system with independent intellectual property rights and military level face recognition algorithm, and connects to daily payment, forwarding, settlement and transaction. In order to provide users with a better payment experience, link. According to the statistics of the international biotechnology group, the profit of the world biometric market in 2007.

Table 1 Structure of Visitor Information Table

Field	Data type	Field description
PID_NO	INTEGER	Number
PID_NAME	TEXT	Full name
PID_BIRTH	TEXT	Date of birth
PID_FACE_FEATURE	BLOB	Face data
PID_ACCESSIBLE	INTEGER	Access identity
PID_TIMEFLAG	INTEGER	Time period access ID
PID_STARTTIME	TEXT	Start time
PID_ENDTIME	TEXT	End time

3. Face Recognition Access Control System Design

According to the system execution program, the face recognition access control system is divided into three main modules. Among them, the acquisition module is responsible for obtaining the face image. Face recognition module consists of four parts: face detection, preprocessing, feature extraction and ID matching. The implementation module of access control system is based on the processing results of face recognition module. The corresponding operation is carried out through the locking of electronic control. At the same time, combined with the actual application scenario, remote request and permission management are added to the functional design of the system. In order to ensure the operation efficiency and recognition performance of the system, it is necessary to select the appropriate hardware equipment and recognition algorithm in the system design.

Table 2 Commonly Used Classes of Sqlite

Class name	Effect
SQLite Open Helper	Responsible for creating and opening database and version management
SQLite Data Base	Manage database ontology, provide add, update, delete, retrieve and execute SQL Instructions and other functions of management database
SQLite Cursor	Indicates the initial location of the query results when retrieving the database
Content Values	Stores and holds data about a row in a table

4. Get an Image

It is a face image recognition system of face image recognition library. For this system, a face image database needs to be established separately to provide a sample set of face images for the next training and recognition stage. Therefore, the facial image acquisition module is a necessary basic component of the system. If there is no image acquisition module, the subsequent recognition

will be meaningless. After collecting the face image with the camera selected as described above, the system saves the collected face image in a folder designated in the form of a file and displays it on the LCD screen at the same time. Next, the implementation of image acquisition is described.

5. Face Recognition Implementation

This algorithm is used to realize the function of face recognition. First, in the training phase, the image acquisition module is used as the training sample to generate the facial feature database. Then, after entering the recognition stage, first extract the feature data of the face image that should be recognized, and compare with the face feature data in the database to display the recognition results.

6. Conclusion

With the rise of the Internet of things and smart home, face recognition access control system will have more extensive application prospects for the strong demand of the public for security. Due to the lack of experience and technology, the system has some areas to be improved. At the same time, in order to meet the higher functional requirements of the society for intelligent access control, the system performance needs to be further improved in the next research work. For example, multi-modal biometric fusion technology can be used, or it can be combined with traditional identification technology (such as smart IC card) to improve the reliability of the identification system; algorithm fusion technology can also be used to effectively integrate multiple algorithms to improve the performance of the identification algorithm; in addition, in the design of the system, wireless network can be considered, combined with smart home To realize the control of mobile phone and other intelligent mobile terminals to the system.

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Law firm OA system development.

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