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Article

Android App Based Attendance System

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A B S T R A C T

Due to low-cost devices, high user acceptance and easily executed, we focus on fingerprints recognition. Today we are use RFID card that has drawbacks to swap another person card that is absent. This drawback is overcome with development of this paper. This method of attendance system is more secure and faster in execution than any other method presented in the market today. The main thing of this project is mark attendance after recognition of fingerprints and the complete process are done with portable feature as this process is done by android smart phones, tablets or any device based on android mobile operating system. The project aim is to design an employee attendance system which reduces the time, resources of an organization. The attendance of an employee is marked based on fingerprint recognition. The best way to mark attendance is fingerprints for biometric detection system because fingerprints are never change for whole life of any person so, it is unique and secure.

Keywords: Biometric, Eigenvector, Fingerprint Identification, Online Attendance, PCA

Introduction

Innovative technologies together with mobility have increased the requirement to have more protected and reliable access through predefined gateways. Many organizations are trying to identify accurate, safe and reliable methods to protect access rights to their existing services or operation. Fingerprint is one answer to these concerns. Fingerprint, especially in information technology, incorporates physical identity analysis methods to exclude various aspects of diagnostic or monitoring purposes.

The cost of deployment of many methods is extremely high, potentially requiring specialist analytical software and machines with the computing power to run it on. There is a lack of consistency of many methods, the wide variance of algorithms results in variouspresentation levels from comparable equipment. The exemption to this antipathy in relation to biometric is the recognition of fingerprints (later called FR); a well-known method of finding a person by comparing finger qualities with a predefined template that many people are familiar with these days. Monitoring attendance has become a prime concern for any organizations and colleges in recent times. Many universities and organizations use paper-based or smart card systems to check the employee attendance. Some projects were attempting to design a program to visit universities and organizations without looking at the latest news; however this paper, unlike existing programs, seeks to improve data accuracy by adding a finger-based register and uses a series of strategies to provide a dependable, applicable and accurate identification process.

The power of this paper is to take a different approach to image processing by reducing the size of the template, making faster comparisons of ownership, performing self-identification work asynchronously.

Problem Statement

Research and analysis of existing monitoring systems have shown that most organizations use an existing record-based system, with only 12% using the wall-mounted RFID swipe

card available to organizations. Problems that have been discovered in using the wall mounted swipe card are:

- The swipe card system is not movable in all rooms
- The system can be deceived by employees (Friend "exchange") Over time after swiping

Problems that have been noticed in using paper-built registers are:

- Paper based registers are not uploaded to a unified system, so the data is lost for analysis
- The system can fooled by "buddy-signing" on behalf of absent employee

Comparison with other Attendance System

RFID and GSM-GPRS based attendance system are also available in the market. These systems have their own advantages and disadvantages. Our system is better than other system because of secure, small is size and portable feature. With the help of portable feature, device could be taken anywhere. While other attendance system such as GSM-GPRS system based biometric used fixed location for marking that is it is not dynamic. The drawbacks of RFID system are that every employee must carry the RFID cards and the detectors of RFID are needed to install. The drawback of RFID system is that the workers may give proxies easily using RFID card of their friends. These drawbacks are overcome in our system with the help of fingerprint identification because fingerprint of each employees is different from each other and unique. One advantage of our system is that employees can mark their attendance with their smart phones and in this way, they can save their time.

How Fingerprint Recognition Work

Fingerprint images that are found or scanned are not of optimum quality. That is why we eliminate noise and increase our quality. We remove features like minutiae and others for matching. If set of minutiae matches those people in the database, then we call it an identifiable fingerprint. After matching, we follow post-matching steps, which may include details of the candidate identified, marking attendance, etc. A brief flowchart is shown in the next section. System administrators can create a new database for new students' fingerprint, which has recently been enrolled within the University (below Figure 1). The lecturer will ask to swipe your finger through the fingerprint scanner to record student attendance.

Fingerprint Student Attendance Register uses identification (multiple requests) using Principal Component Analysis (PCA). This system needs build-in database to authenticate. In this process, a test involves inserting the fingerprint image, applying the PCA, the minimum distance between the test images and the nominated images in the database.

This system uses three different algorithms to complete the identification process. The first phase creates a built-in fingerprint database using the following process:

- Create data databases
- PCA computer
- Apply the PCA to the data set

The second step is identification. This process involves:

- Make a test image vector
- Apply computed PCA to test image

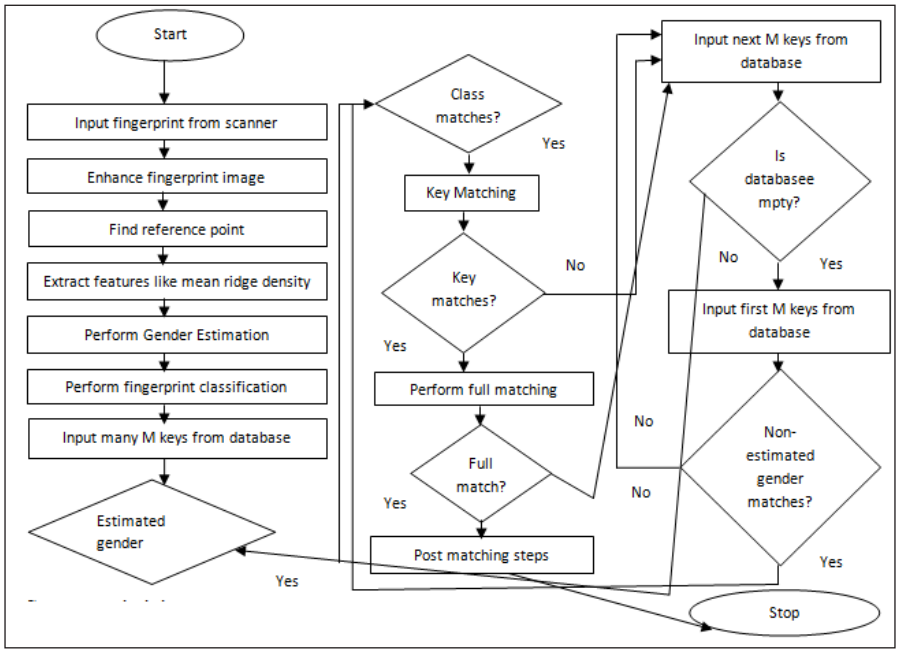

Figure 1

- Calculate distance of provided test image with all images in database
- Select the minimum distance

All the mentioned processes need preparation to create datasets, appropriate algorithms, the knowledge of how to address them.

Experiment and Test

Refine Dataset to Desired Parameters

The size of each fingerprint image on disk was 140KB-355×390 pixels. The sample captured image is shown in Figure 2, given below, which was provided by the Gr Finger X sample application.

All images had been cropped and resized for placing into the new datasets. The best size for processing in Math work MATLAB software was between 30×30 pixels to 200×200 pixels, dependent upon the number of dataset files and how much further processing on them would be required. The purpose of this paper was to determine whether a very small image size resulted in too manyerrors. Therefore, all images were resized to 64×64 pixels.

64×64 Pixels images were selected because the effective part of the original pictures varied for different fingers, this compromise gave the best data quality but the smallest size of database. GR Finger used for finger grabbing, the application was developed for java. Some research has been done on modifying Java code to create and analyze an image in a single transaction, but this was omitted due to time constraints. All sample fingerprint images were cropped and resized by Adobe Photoshop CS6.

Figure 2.A Fingerprint Captured by Microsoft FP Scanner

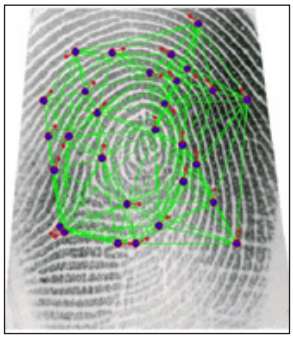

Figure 3.Cropped Fingerprint Images (64×64 Pixels)

PCA Process to get Eigenvector Map

Methodology

PCA is a technique of analysis to reduce the size of stored data without losing the important data itself. It brings compression as well as noise filtering and data can be classified better. The process of Principal Component Analysis is to apply a translation vector to all the images in the dataset, then to determine the mean of the data before calculating the covariance matrix and finally extracting the eigenvalue andeigenvector to map them to a new space.

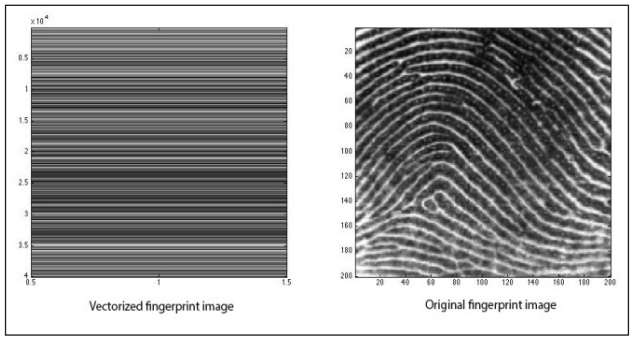

Figure 4.Gr Finger Application Interface for Capturing Fingerprints

Apply a Translation Vector

Each fingerprint image has been standardized at 64×64 pixels, which was defined in the datasets section. After inserting the image, the result was a 64×64 matrix. Applying a translation vector to this image helps the system to convert images into only one line (in this case 1×4096) for database storage.

Development

The source code of the home page has been developed purely to provide access to the application. Note that this page does not use any form of password-based authentication.

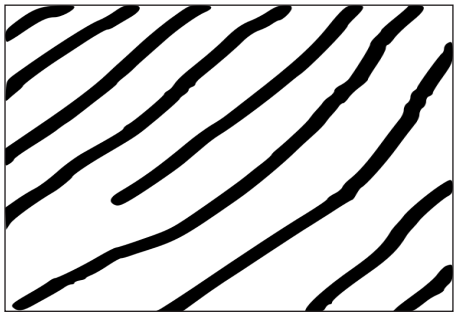

Figure 5.Ridge Ending

There are three main functions involved in fingerprint testing, Search, Registration and verification. The registration function inserts a fingerprint scanner with the help of a sensor. When it comes to verification functionality, there are many ways to compare link-based comparisons,

minutiae-based comparisons, feature-based comparisons, minutiae-based fingerprint algorithms such as a fingerprint. However, the same standard algorithm used for beginners is extremely popular because of its accuracy and efficiency.

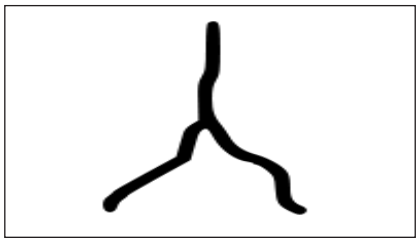

Figure 6.Bifurcation

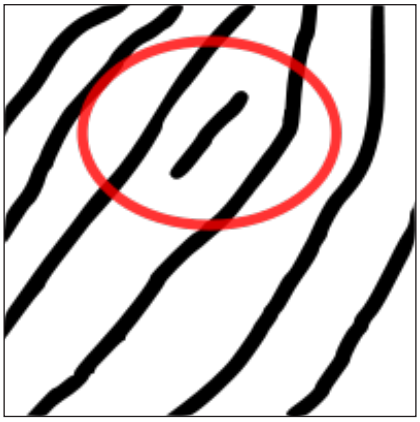

Figure 7.Short Ridge (dot)

Identification and Classification of Individual Fingerprints

Fingerprint identification, also identified as dactyloscopy or fingerprint identification, is used to determine if this manifestation is possible, including the finger or toe, the palm of the hand or the sole of the foot, the imaging process of comparing two examples of skin appearance. Have come from the same person.

Flexibility of the friction ridge skin means that no two fingerprints are exactly the same in each description. Two hands were immediately recorded with one hand which could be slightly different. The recognition of Finger print, which is also known as personalization, involves an specialist, an specialist computer system which is processing under 'threshold scoring' laws, determining whether consecutive ridge impressions are from the same finger.

An intentional recording of the friction roof is usually made with a contrasting white background, usually ink with rolled black printer in a white card. A friction roof can be digitally recorded on a glass plate using a technique known as a live scan. A "secret print" is the chance of recording friction roof deposited on an object or wall surface. A "secret print" is the chance of recording friction roof deposited on an object or wall surface. Latent Print is invisible for naked eyes, while "patent print" or "plastic print" can be seen with irregular eyes. Frequently the latent prints are fractured and require to use chemical methods, powder or alternative light sources in order to be made clear. Occasionally the latent print will make visible with bright light.

Figure 8

When frictional mountains come in contact with a surface a which will take a print, then the material that is on the friction mounted like sweat, oil, ink or blood, will be transferred to the surface. Factors affecting the quality of Friction Ridge Impressions are numerous. The skin, coagulation pressure, the surface of the sleepy surface, the surface from which the surface is formed, the roughness of the surface is deposited and the substance is only a few factors that can cause a secret print to look different from any known recording. Friction roof. Actually, the circumstances around the surrounding friction ridge coagulation are unique and never be copied. Due to these reasons, the testers of fingerprint must provide comprehensive training. The scientific study of fingerprint is called dermatoglyphics.

Before using a computer, a standard file system was used on large fingerprints. The most common ridge patterns for all or all the fingers have come under the manual separation system. Allow only the completion and return of paper records in a large collection based on the ride pattern of fiction. To help look at the filling system, the most popular systems use a pattern measured with each finger to make a key (number).

There are three basic finger patterns in Henry's system division: whorl, loop, arch, forming 30- 35%, 60-65%, 5% of all fingerprints separately. There is some more categorization system are available that are used to break down forms even further, into tented or plain arches and into loops depending on the side of hand toward which the tail points, loops are either radial or ulnar.

The system used by most experts, though complex, is like the Henry system of classification. There are five degrees in which R is correct, L is to the left, I for index finger, M for middle finger, T for thumb, Ringer finger and P (pinky) for short finger R. The differences are as follows: RE/ RT + RR/ RM + Lt/ RP + Lm/ Li + LP/ LR. The numbers assigned to each print are based on whether they are whorls or not. In the first fraction a whorl is given 16, the second

one is 8, the third one 4, quarter 2 and 0 in the previous fraction. Valves of arches and loop 0 are assigned. After all, numbers are added in the numerical and denominator using the scheme:

(Ri + Rr + Lt + Lm + Lp)/ (Rt + Rm + Rp + Li + Lr)

And to exclude any possibility of division from zero, a^1 is added in both up and down.

For example, if the finger of the right ring and the index of the left index is curved, the fraction will look like this:

0/ 0 + 8/ 0 + 0/ 0 + 0/ 2 + 0/ 0 + 1/ 1 and the calculation: (0 + 8 + 0 + 0 + 0 + 1)/ (0 + 0 + 0 + 2 + 0 + 1) = 9/ 3 = 3.

Using this system reduces the number of prints that the print in question needs to be compared to. E.g., the set of above prints would only need to be compared to other fingerprint's sets with a value of 3.

Conclusion

The paper mainly involved the development of attendance management system and fingerprint detection system. This project presented a framework in which attendance management can be made automated and online. A common implementable approach was proposed for the presence management using LAN. In addition, the idea of using transportable devices with wireless LAN or mobile 3G network was suggested.

For student identification, this fingerprint-based system is earlier and safe in anyother fingerprint identification system. For fingerprint recognition, the gaberfilter[1] the abundant growth in the minutia extraction[1] using the crossing number concept to counterfeit and limit minutiae removal, fingerprint classification[3] reference point identification[2] etc. are employed after. In addition, various new concepts have been invented in this new fingerprint identification system such as gender estimation and key matching for many people. Fingerprint classification and gender estimates are planned to split the database to reduce search space. The key-based mailing identification method has been very quick compared to traditional identification techniques shown by our identification analysis in Section 8.6.2 and 8.7. We used FVC 2004, FVC 2000 and Verfinger Databases for experiments. The time complexity of our identification system was O (N + N) which is much better than the O (N 2N) of the existing identity system.

Future Work and Expectations

Regarding our fingerprint detection system, we are planning to introduce more indexing techniques such as ridge density tolerance etc. to make the search faster. The key to be used even when using a complex key will be more efficient. We are trying to reduce the matching error rate. The student attendance system is designed using LAN in this paper. We have thought of using wireless LAN The problem of using wire-less LANs is that wireless devices are expensive and implementation is difficult because wireless devices work in a small area. Our Institute PSIT, Kanpur has spread to a large area, so we can no longer use the wireless network. Alternatively, we can use the mobile network (Sec 2.5) which would be adequately suitable because nowadays the 3G network provides amazingly fast. This will meet the speed requirements of the necessary throughput and data fetching.

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