A Method for Obtaining Electronic Voting Systems based Voter Confidentiality and Voting Accuracy

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Abstract— A Voting is common in our daily life, from electing president to electing committee. A complete electronic voting scheme suitable for all kinds of voting with safe guaranty where the voter's privacy can be protected. Fingerprint system security have been investigated, including the use of fake fingerprints for masquerading identity, the problem of fingerprint alteration or obfuscation has received very little attention. Fingerprint image quality assessment software (e.g., NFIQ) cannot always detect altered fingerprints since the implicit image quality due to alteration may not change significantly. The main contributions of this Research are-1.Compiling case studies of incidents where individuals were found to have altered their fingerprints for circumventing AFIS.2.Identifying the damages of fingerprint alteration on the accuracy of a commercial fingerprint matcher.3.Classifying the alterations into three major categories and suggesting possible countermeasures.4.Developing a technique to automatically detect altered fingerprints based on analyzing orientation field and minutiae distribution.5.Evaluating the proposed technique and the NFIQ algorithm on a big database of altered fingerprints provided by a law enforcement agency. Experimental results show the feasibility of the proposed approach in detecting altered fingerprints and highlight the need to further pursue this problem.

Keywords:*IRIS,AFIS,NFIQ.*

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I. INTRODUCTION

In this work a secure electronic voting protocol that is suitable for large scale voting over the Internet.Fingerprint identification technology, coupled with the growing need for reliable person identification, have resulted in an increased use of fingerprints in both government and civilian applications such as boundary control, employment background checks, and secure facility access.The primary purpose of fingerprint alteration is to evade identification using techniques varying from abrading, cutting, and scratching fingers to performing plastic surgery.It should be noted that altered fingerprints are different from fake fingerprints. The use of fake fingers—made of plastic surgery, latex, or silicone—is a well-publicized method to circumvent fingerprint systems. In order to detect attacks based on fake fingers, many software and hardware solutions .1.Fingerprint-based biometric systems are much more widespread for large scale identification than any other biometric modality.2.it is relatively easy to alter one's fingerprints using chemicals and abrasives both are compared to, say, one's iris or face, where a more elaborate surgical procedure may be necessary;

Fingerprint Singularity Region Extraction:

First read the fingerprint images. A fingerprint image can be enhanced by charting the intensity values using the histogram equalization. i. e. Histogram equalization is usually growths the global difference of an image. Then we are going to extract the uniquenessarea with help of threshold. Particular fingerprint zones surrounding singularity points namely the core and the deltals is known as singularity region. After that get the segmented fingerprint image .

II. LITRATURE SURVEY

A Method for Capturing the Finger-vein Image Using Nonuniform Intensity Infrared Light

In the finger vein authentication, one problematic is that the variable finger illumination makes the veins unclear.For the same reason it is difficult to get the intactfinger-vein pattern which contains more features.In this paper, we developed an new rule to adjust the intensity of the light, which can solve the problem mentioned. We propose three criterions, the standard deviation of the gray level, total length of therein and the number of bifurcations, to judge the quality of the image. In our experiment, our way makesthe brightness of the finger additional uniform, thus the standard deviation of the gray level decrease by 48.4% on average. The numbers of two features, the veins andits junctions, upsurge by 44.1% and 31.4% respectively.Using our method, we have built a finger vein image database which has 600 images.

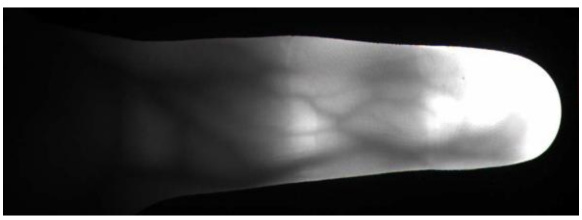

Fig.1.1 Infrared Images

Method:

As mentioned, the sensor could not capture the intact finger-vein pattern because of its limited response range. However, a wide response range sensor is too expensive for a low-cost device. So we must find another way to get the intact finger-vein pattern.The sensor is a device to transform the signal from the sum of light intensity during the shutter open time into an 8-bit gray level for each pixel in the image.Here is the transform function.GL(x) is a monotone increasing function (ideally,it is a linear function),and E is the radiation dose during the shutter open time.The relationship among the E,the shutter open time τ and the light intensity received by sensor Io is as follows. The infrared light transports in the fingers in accord□ with the modified Beer-Lambert equation .AC Where Ii is the input light intensity, d is the opticalpath length dependent upon the AC, SC, the scattering phase function and the distance between the source andsensor, and G is an unknown geometry dependent factor.Because the SC and AC of the vein are different from the other parts of the body, after the infrared light of the same intensity passes through the finger, the intensity of the infrared light that passes through the vein is different from the infrared light that doesn’t passes through the vein, the gray level captured by the sensor is also different, so we can find the vein in the image.

A Real-Time Palm Dorsa Subcutaneous Vein Pattern Recognition System Using collaborativeRepresentation-Based Classification

This paper describes the development of a real-time system for the recognition of a real human subject using the palm dorsa subcutaneous vein pattern (PDSVP) as a physical biometric feature. The system has been developed using a lowcost, single board computer, called the Raspberry Pi Model B,in conjunction with an infrared delicatecamera,called the Raspberry Pi No Infrared camera, and other components. The camera is delicate to near infrared (NIR) radiations and this acquisition property has been used to acquire the pattern of vascular structure present in the hypodermic layer of the dorsum of the human palm. Moreover, an automatic two-axispan-tilt mechanism has been developed on which the camera is mounted. This is a completely novel mechanism that has beendeveloped so that the data acquisition is independent of the position where the palm dorsum is positioned, as an involuntary palm dorsum self-locating strategy is industrialized using the two-axis pan-tilt mechanism. Now, the NIR images of the PDSVP acquired, in the aforementioned methodology, do not signify the vein pattern with considerableclearness and discernibility. Therefore, each image acquired undergoes few steps of image preprocessing, to extract the vein pattern, before they are subjected to testing circumstances or they are incorporated into the training database.The recognition strategy has been developed using the collaborative representation-based classification. In this paper,we have highlighted upon the most severe case of small example size, which is single sample per person-based training data set creation. The proposed method is tested on a well-structured database, of NIR images of the PDSVP,JU-NIR-V1:NIR Vein Database, industrialized in the Electrical Instrumentation and Measurement Laboratory, Electrical Engineering Department,Jadavpur University, Kolkata, India. Then, through extensive experimentation it has been proven that the proposed strategy attains substantially high and stable recognition rate. Moreover, the presentation of the recognition strategy is highly robust even in the presence of artifacts, such as bony displacement and scaling that corrupt the NIR images acquired during data acquisition.

REAL-TIME SYSTEM DEVELOPMENT ANDDATABASE CREATION

As already mentioned and reasoned, NIR imaging technology has been used to acquire the venous pattern of the palm Now, we have developed an automatic two-axis pantiltmechanism on which the camera is mounted, which is used to self-locate the palm dorsum of the subject under test and, thereby, providing the user with desired convenience and ease of data acquisition.

A. Integrated System Development:

The system has been developed using a low-cost, single board, credit-card-sized computer, which is known as the Raspberry Pi Model B [23]. In conjunction with the aforementioned, Raspberry Pi Model B, an NIR sensitive camera, called the Raspberry Pi NoIR camera [24], is used to acquire the NIR images of the PDSVP. Finally, the complete integrated system developed by us for real-time human recognition using PDSVP as a physiological biometric feature is shown in Fig. 1. On closely observing Fig. 1, one can easily notice that the system is an integration of smaller components and units:1.power supply; 2.two-axis pan-tilt mechanism; 3.display device; 4. NIR LED array; 5.keyboard; and 6. mouse and other components. Fig. 2 shows the salient steps undertaken to assemble and integrate the entire system for data-acquisition and testing. Now, that the entire procedure of developing the complete integrated system for real-time human recognition using This article has been accepted for inclusion in a future issue of this journal. Gratified is final as presented, with the exclusion of pagination.

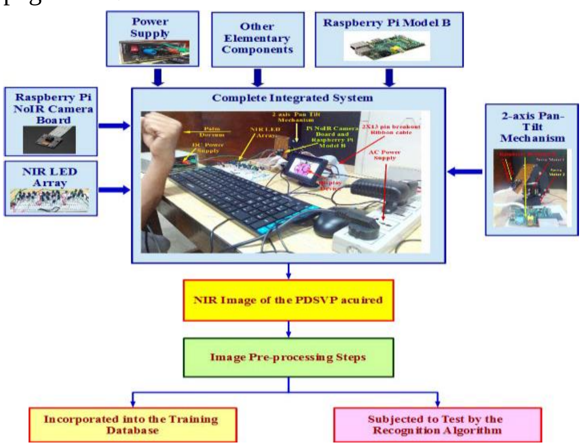

Fig.1.2.Real Time System

Salient steps undertaken to assemble and integrate the entire system for data-acquisition and testing.PDSVP as a physiological biometric feature has been developed, in

Section II-B, we discuss about the data acquisition,image preprocessing, and database creation.

B. Data Acquisition:

When the NIR light incident on the palm dorsum the reduced hemoglobin in the blood flowing through the veins absorb more incident radiation energy than that by the surrounding tissues [13]. The cross-sectional view of the subcutaneous tissue of the palm dorsum region is shown in [25]. The NIR light penetrates to a depth of ∼3 mm into the subcutaneous tissue [13]. This property of absorption of NIR light by the venous blood results in the veins appearing as darker regions in the NIR images acquired, which allows us to acquire the PDSVP by NIR imaging technology.Images were acquired in a laboratory environment of temperature ∼22 °C–24 °C, and humidity of ∼95%. An NIR images of the palm dorsum of the right hand are acquired for all subjects. The NIR image of the palm dorsum of the right hand of a subject is shown in Fig. 6.It is clearly observed from Fig. 6 that there are unwanted objects present in the background (in the raw NIR image) of the required object (palm dorsum), which needs to be cropped out and one can easily perceive that the discernibility of the venous pattern of the palm dorsum, from the raw NIR image, is very poor. Therefore, the imminent step is that of cropping out the unwanted objects present in the background and, finally, obtaining a grayscale image from the RGB image (raw NIR image), so as to reduce memory consumption which is of prime importance for any kind of real-time system. Subsequently, to crop out the palm dorsum region from the raw NIR image shown in Fig. 6, we need to determine from the two-level thresholded /binary image (shown in Fig. 6) the initial and final row, and initial and final column, of the Fig.3. Trench-like characteristics of the intensity profile of the vein region. Fig.4. Three patterns of vein in the palm dorsum subcutaneous tissue. cropping window.

III. BIOMETRIC RECOGNITION

Ainclusivechange of systems requires consistent personal recognition systems to either confirm or control the identity of an individual requesting their services. The purpose of suchschemes is to confirm that the rendered services are accessed only by a real user and no one else. Examples of such applications include secure access to buildings,computer systems, laptops, cellular phones, and ATMs. In the absenteeism of healthy personalacknowledgmentsystems, these systems are vulnerable to the wiles of an impostor. Biometric recognition or,simply, biometrics refers to the automatic acknowledgment of persons based on their physical and/or behavioral characteristics. By using biometrics, itis possible to confirm or establish an individual's character based on "who she is," rather than by "what she has" (e.g., an ID card) or "what she recalls" (e.g., a password). In this paper, we give a brief overview of the field of biometrics and review some of its advantages, disadvantages, strengths, limits, and associated privacy fears.

BIOMETRIC SYSTEMS:

A *biometric system* is essentially a pattern recognition system that runs by getting biometric data from an separate, removing a feature set from the acquired data, and comparing this feature set against the template set in the database. Dependent on the application situation, a biometric system may activate either in *confirmation*mode or *identification*mode.

1.In the verification mode, the system validates a person's identity by linking the captured biometric data with her own biometric models stored in the system database.

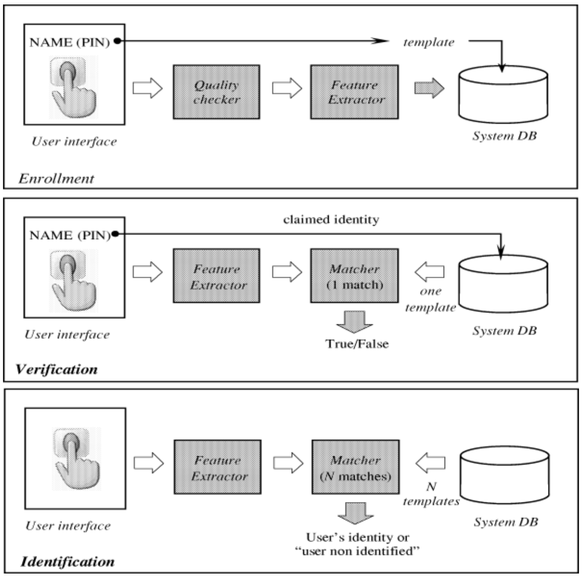

Fig1.3.Block diagrams of enrollment, verification, and identification

Responsibilities are shown by the four main elements of a biometric system, i.e., sensor, feature extraction, matcher, and system database.

In such a system, an individual who needs to be recognizedrights an identity, generallythrough a personal identification number (PIN), a user name, or a smart card, and the system conducts a one-to-one comparison to determine whether the real is true or not (e.g., "*Does this biometricdata belong to Bob?*"). Identity verification is typically used for *positive recognition*, where the aim is to prevent multiple people from using the same identity.2.In the identification mode, the system recognizes an individual by searching the templates of all the operators in the database for a match. Therefore, the system manners a one-to-many evaluation to establish an individual's identity (or fails if the subject is not enrolled in the system database) without the mattertaking to prerogative an identity (e.g.,"*Whose biometric data is this?*"). Identification is a critical component in *negative recognition* applications where the system founds whether the person is who she (implicitlyor explicitly) rejects to be. The resolution of negativerecognition is to prevent a single person from usingmultiple identities. Identification can also be used in positive recognition for suitability (the user is not required to claim an identity). While traditional methods of personal recognition such as passwords, PINs, keys, and signs may work for positive credit, negative credit can only be conventional through biometrics Through this paper, we will

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use the generic term *recognition* where we do not demand to type a difference between confirmation and identification. The block diagrams of a verification system and an identification system are depicted in Fig. 1; userenrollment, which is common to both of the tasks, is also graphicallyillustrated.

Existing fingerprint quality assessment algorithms are designed to examine if an image contains sufficient data (say, minutiae) for identical, they have limited aptitude in causal if an image is a ordinary fingerprint or an altered fingerprint.Obliterated fingerprints can evade fingerprint quality control is damage.If the affected finger area is small, the existing fingerprint quality assessment software may fail to detect . The decision is taken by considering the unimodal through an and operator.Biometric trait being sensed or measured is noisy.The resultant matching score computed by the matching module may not be reliable. No match calculation between two print.In Proposed System was evaluated at two levels: finger level and subject level.The proposed algorithm based on the featuresextracted from the orientation field and detailsplease the three essential requirements for changeexposure algorithm:

1) Fast operational time,
2) High true positive rate at low false positive rate, and
3) Ease of integration into AFIS.

Final decision making is based on two kinds of information.Multimodal biometric systems can provide a better identification accuracy.Detect the center radius and circumference of the pupil and iris region.The score is calculated based on the crossing matching between the fingerprints.

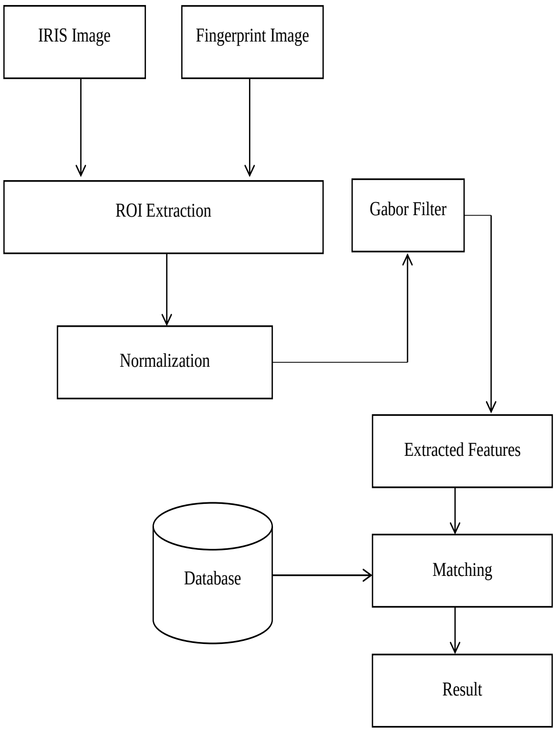

Fig1.4. Architecture

IDENTIFICATION:

Iris and fingers print images are preprocessed to abstract the ROIs (Regions of Interest). Iris copy preprocessing is per-formed by segmenting the iris region from eye and deleting the eyelids and eyelashes. Fingerprint image preprocessing is performed by segmenting the originalityarea from finger-print. The removed ROIs are used as input for the standardization. Then normalized data is given to the Gabor filters. After that the minedstructures are stored in pattern data base. Though in identification element theses template data bases are match with input template to identify the person.

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IV.CONCLUSION

In this paper, a practical finger vein-based personal identificationsystem is designed and verified through experiments.In addition, we showed that recognition rate is largely affected by the completeness of the finger vein pattern. Through our acquisition equipment with the effective illuminance controlalgorithm, we are able to acquire high-qualityfinger vein image. In this way, the useful information for personal identification could be largely retained in the finger vein image. A well-designed Gabor filter bank could enhance the original gray-scale image and extract more accurate texture features of finger vein pattern. Finally, a sparse representation via norm algorithm is used to predict the true class of test image. In the future, we would like to extend this paper along the following directions.First, a Gabor filter bank of 24 filters is used this paper, which, however, is more than necessary based on our resultsof our experiments. From we can see that the majority of finger veins grow vertically, while some grow diagonally antidiagonally. Rarely will we see vein growing horizontally. In addition, since the width of the finger vein is always limited, not the all scales are needed. Therefore, we might be able to remove the filters from the filter bank whose orientation θ is close to $\pi/2$ and whosescale σ is either bigger than the maximum width of the finger vein or smaller than the minimum width of the finger vein.Last but not the least, we are still in the process of extending our database. As the number of the samples keeps increasing, the dictionary matrix A will be become ever large. Consequently, the referring time will increase linearly, whichRenders optimization inappropriate for this task. Thus the machine learning-based method, such convolutional neuralNetwork CNN, which though requires rather long training time but quite short referring time, could be potentially used in our future work.

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