Web Server Based Secure Real Time Embedded System for ATM

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Abstract— *The project designing and of existing ATM's are not much secure in favor of customer and users. Now a days the trends of mobile banking and mobile account accessing is grows up. ATMs have become very popular with the general public for their availability and general user friendliness. ATMs are now found in many locations having a regular or high volume of consumer traffic. These type of devices are useful for customers and banks too. The technology adopted and revised daily to made it possible to embed more facilities in mobile phones. But the major problem of bank transaction is security. The Secure cash or amount transaction is of serious major problem as concern in growing use of cash cards and internet transactions. However there is lots of limitations regarding design, flexibility, security and much more. In this project will introduce the concept of physical data accessing and development of ATM system that will allow customers to use mobile phones to Access and case transaction from ATM machines.*

Keywords— PIC* microcontroller, *alert module, data transferring, image recognition system, voice chip.

I. INTRODUCTION

Automated teller machines (ATMs) are well known devices typically used by individuals to carry out a variety of personal and business financial transactions and/or banking functions. ATMs have become very popular with the general public for their availability and general user friendliness. ATMs are now found in many locations having a regular or high volume of consumer traffic. For example, ATMs are typically found in restaurants, supermarkets, Convenience stores, malls, schools, gas stations, hotels, work locations, banking centers, airports, entertainment establishments, transportation facilities and a myriad of other locations.

ATMs are typically available to consumers on a continuous basis such that consumers have the ability to carry out their ATM financial transactions and/or banking functions at any time of the day and on any day of the week. An automated teller machine or automatic teller machine (ATM) (American, Australian and Indian English),also known as an automated banking machine (ABM) in Canadian English, and a cash machine, cash point, cash line or sometimes a hole in the wall in British English and Hiberno-English, is a computerized telecommunications device that enables the clients of a financial institution to perform financial transactions without the need for a cashier, human clerk or bank teller. ATMs are known by various other names including ATM machine, automated banking machine, cash dispenser" and various regional variants derived from trademarks on ATM systems held by particular banks. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smart card with a chip that contains a unique card number and some security information such as an expiration date or CVVC (CVV). Authentication is provided by the customer entering a personal identification number (PIN).

In this proposed system we have created the new generation ATM machine which can be operator without the ATM card. By using this system ATM machine can be operator by using our SIM in the mobile phone. When we insert our SIM in the reader unit of the ATM machine it transfers the mobile to the server. In server we can collect the related information of the mobile number (i.e). the users account details, their photo etc. the camera presented near the ATM machine will capture the users image and compare it with the user image in the server using MAT LAB. Only when the image matches it asks the pin number and further processing starts. Otherwise the process is terminated. So by using this system need of ATM card is completely eliminated we can operate the ATM machine by using our SIM itself. By using this system malfunctions can be avoided. Our transaction will be much secured. One more application can also be added in this system for helping the blind people. In the existing system all the transactions are done through keyboard only. It may be difficult for blind people so we can also add voice annunciation to indicate each and very process to the blind people. It that enables a visually and/or hearing impaired individual to conveniently and easily carry out financial transactions or banking functions.

II. EXISTIN GATM SYSTEM

A.Related Work

Existing ATMs are convenient and easy to use for most consumers. Existing ATMs typically provide instructions on an ATM display screen that are read by a user to provide for interactive operation of the ATM. Having read the display screen instructions, a user is able to use and operate the ATM via data and information entered on a keypad. The drawback in the existing system is that the user should carry their ATM card without fail. However in many cases we forget it. So only we designed a system which helps us to use the ATM machine without the ATM card.

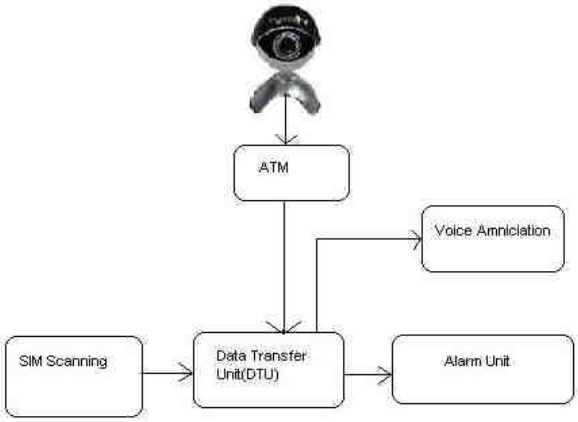

Fig.1:Block diagram of secure real time embedded system for ATM

B.Initial Work On ATM Security

So far, numerous approaches using texture features have been developed and successfully applied to FR. These works roughly fall into four categories: A) methods using Gabor wavelets or LBP features; B) methods using the fusion of global and local face features; C) methods using the fusion of magnitude and phase information of Gabor wavelets; D) methods using fusion of Gabor and LBP. However, most of these works have been limited to grayscale texture analysis. FR using color information is a relatively new research topic in the area of automatic FR. Initial works on color FR focused on determining fixed color-component configurations (from various color spaces) suitable for FR through empirical comparisons. Color space conversions in order to further obtain an enhanced FR performance. In [31], the authors proposed an optimal conversion of color images in the color space into a monochromatic form. They developed a color image discriminate model to find a set of optimal combination coefficients and demonstrated the usefulness of the proposed monochromatic representation. Liu [32] proposed three new color representations, i.e.so-called uncorrelated color space, the independent color space, and the discriminating color space. Author in [32] shows that the later three-color representations are effective for enhancing the FR performance, as compared with the use of color images represented in the color space. In [20], the authors found out a common characteristic of a powerful color space for FR by analyzing the transformation matrix of the different color spaces from the color space. In addition, based on the characteristic of powerful color spaces, they proposed color space normalization techniques, which are able to convert weak color spaces into powerful ones, so that better FR performance can be obtained by making use of these normalized color spaces.

C. Methods

There are two methods are used to implement the 3G Atm for improving the Face Recognition using color local texture features.i.e (a).color local Gabor wavelet (b).Color local binary pattern.

III. FRAMEWORK OF FACE RECOGNITION USING COLOR LOCAL TEXTURE FEATURES

The proposed color FR framework using color local texture features consists of three major steps: color space conversion and partition, feature extraction, and combination and classification. A face image represented in the color space is first translated, rotated, and rescaled to a fixed template [14], yielding the corresponding aligned face image. Subsequently, the aligned color image is converted into an image represented in another color space. Note that not only conventional linear or nonlinear color spaces (e.g., or) but also new color spaces devised for the purpose of FR (e.g., normalized color space proposed in [20]) can be used for color space conversion. Each of the color-component images of current color model is then partitioned into local regions as suggested by [4].In the next step, texture feature extraction is independently and separately performed on each of these local regions. Since texture features are extracted from the local face regions obtained from different color channels, they are referred to as “color local texture features.” Note that the key to FR using color information is to extract the so-called opponent texture features [25] between each pair of two channel wise texture features. spectral images, as well as unichrome This allows for obtaining much more complementary texture features for improving the FR performance, as compared with grayscale texture feature extraction, where only the luminance of an image is taken into account.

Since N color local texture features (each obtained from the associated local region and spectral channel) are available, we have to combine them to reach the final classification. To this end, multimodal fusion techniques [26] are employed for integrating multiple colors local texture features for improving the FR performance. In the following subsections, the detailed explanation of color local texture feature extraction and combination and classification steps are provided (For further details regarding color space conversion and partition methods, refer to [27] and [4], respectively).

IV. EXPERIMENTATION

An experimental study was carried out to investigate the effectiveness of the proposed color local texture features for FR. The subsection describes in detail the face DBs used in this experiments, as well as new evaluation methodology.

A. Experimental Setup and Condition

Four openly available face DBs, i.e., CMU-PIE [13], Color FERET [14], XM2VTSDB [15], SC face [17], and FRGC 2.0 [16], were used to estimate the proposed color local texture features. All facial images used in this experiments were manually cropped from original images based on the locations of the two eyes. The eye coordinates are those supplied with the original data set. Each cropped facial image was rescaled to the size of 120*120 pixels (see Fig. 3). After alignment, each of the facial images with a size of 120*120 is divided into the 64 different face local regions to compute the proposed color

local texture features. Therefore, the size of each local region is 15 15 pixels. To construct a face feature extractor (described in Section V), five popular low-dimensional feature removal techniques were used, i.e., PCA[25],Fisher's linear discriminate analysis(FLDA)[23],Enhanced Fisher linear discriminate. Model (EFM) [7], eigen feature regularization and extraction (ERE) [28], and kernel direct discriminate analysis (KDDA) [26]. A radial basis function was adopted as the kernel function for implementing the KDDA [26]. The PCA and the FLDA are commonly used as benchmarks for the evaluation of the performance of FR algorithms [14].

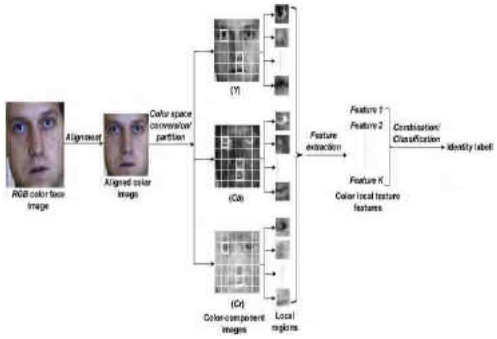

Fig..2:Framework Of Face Reorganization Using Colour Local Texture

The EFM is anpopular face feature extraction techniques based on linear discriminate analysis (LDA). In particular, it has been reported in [7] that the EFM guarantees a better generalization performance than FLDA by avoiding the over fitting problem. The ERE outperforms all other DA based FR methods discussed in [28]. the KDDA in [26], shows considerably a better FR performance compared with other popular kernel-based FR methods (such as kernel PCA and kernel LDA). As for the NN classifiers, the Euclidean distance was used for the FLDA and the KDDA, whereas the cosine distance measure was used for the EFM and the ERE (as recommended in [7] and [28], respectively), and the Mahalanob is distance [27] was employed for the PCA. In our experiments, five different scales and eight different orientations, which are most widely used for FR [6], [7], are employed to construct a set of Gabor filter banks defined in [1]. In addition, we down sampled each Gabor wavelet presentation by a factor of 36 for the purpose of reducing the dimensionality and the computational complexity [7]. The down sampled version of each Gabor representation is then used to produce the corresponding column vector. Note that, as described in [7], the FR performance difference is quite marginal, as compared with the case where down sampling is not performed. In the case of LBP operations shown in (5) and (11), following the recommendation of [8], adopted by the LBP operator (i.e., and). In order to generate color-component images, two effective
color representations (devised for the purpose of FR) were used in our experiments, i.e., the normalized hybrid and color representations [20].To derive the normalized hybrid color representation employed the across-color-component normalization technique suggested by [20] as this method achieves the best FR performance of all normalized color spaces evaluated in [20]. In addition, color representation shows the best FR performance of all possible color-component image configurations discussed in [18]. In this experiments, the cumulative match curve [14] and the face verification rate (FVR) at the false accept rate (FAR) [22] were used for measuring the identification and verification FR performance, respectively.In general, the FR performance relies on the number of low dimensional features used [28].Therefore, in order to realize a fair comparison, the best found correct recognition rate (BstCRR) proposed in [26] was selected as the identification rate. In addition, in all experiments, the frontal view images with neutral illumination and expression were used to build the gallery set.

B. Effectiveness of Color Local Texture Features for FR

Here, we compare the FR using the proposed color local texture features with the FR using grayscale texture features and the FR using only color information. For FR using grayscale texture features, only luminance information is applied to extract grayscale Gabor wavelet or LBP features. In our experiments, the channel [18] from color space was adopted for extracting grayscale texture features. For FR using only color information, given different color component images, individual color-component vectors were first generated in the form of a column vector by lexicographic ordering of the pixel elements of corresponding color-component images [18]. In order to guarantee fair and stable comparisons with the method using this color local texture features, the low-dimensional features of these color-component vectors were then combined at the level of features in the same way as described in (15) (but not using Gabor or LBP). The resulting concatenated features are applied to FR. In order to validate the advantage of making use of the feature-level fusion approach to combining color local texture features, we report the experimental results obtained using the pro-posed feature-level fusion, as well as using the decision-level fusion. For the case of using the decision-level fusion, a sigmoid function [30] followed by a sum normalization method [30] was used to normalize the matching scores (e.g., distance scores). Also, the sum rule [24] was adopted for combining these multiple matching scores at the decision level. It has been shown in [24] that the sum rule achieves the best classification performance in comparison with other decision-level fusion strategies, such as product and median rules. In the following three subsections, we present comparative experimental results to validate the effectiveness of color local texture features for FR under variations in illumination, pose, and resolution, respectively.

V. CONCLUSION

In the proposed web server based secure real time embedded system for ATM, effective alert unit, process allusion module, mobile communication technologies. In this system each processing information produces by voice annunciation module. This process is effective for security, banking and data transferring application. In proposed two

effective Color local texture features, i.e., CLBP and CLGW. In this paper it is suggested the feature-level fusion approach, which maximizes their complementary effect in the context of FR. The important result is the paper is color local texture features allows for a significant improvement in the FR accuracy.

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