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SECURED HUMAN IDENTIFICATION USING FINGER VEIN

R. Aasir Allwin[1], M. Joanna Felcy[1], S. Jothijob[1], and N. Bagyalakshmi[2]

[1]UG Student, Department of EIE, Adhiyamaan College of Engineering, Hosur, India

[2]Faculty, Department of EIE, Adhiyamaan College of Engineering, Hosur, India

ABSTRACT: The novel method to recognize the person by the use of finger vein. The steps for the acquired finger vein image normalization, image alignment, and segmentation to effectively minimize resulting intra-class variations in the finger images are also developed. It is combining finger vein. Here comparative evaluation of the proposed fusion approaches with the sum, average, product, weighted sum. The segmentation of the finger vein from the image takes place. The ROI region is extracted, after the extraction of vein pattern by the maximum curvature. From the segmented result the Features for vein image is extracted. The Gabor feature for the input image is used as filter. Gabor filters are similar to those of the human visual system, and they have been found to be particularly appropriate for shape representation and discrimination. It is a linear filter used for edge detection. Finally weighted matching is calculated for the identification.

KEYWORDS: human identification, finger vein.

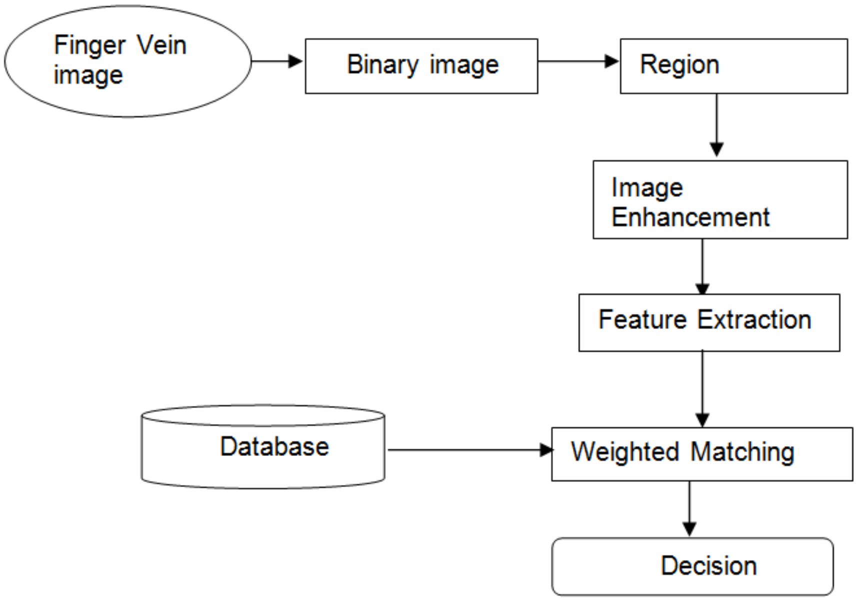
INTRODUCTION

The identity of character is more important in security system. In biometrics scanning this method of detection is easy to use and more comfortable. The fingerprint, face reputation, voice popularity, Iris reputation are used for the safety reason to avoid pseudo person. Historically, the authentication mode which includes keys, password and magnetic card are not safe sufficient now a days, due to the fact they will be stolen easily or may forgotten [1]. The low quality finger vein images may cause the followings. There are some kinds of noise (e.g., sensor noise, finger noise, etc.)[9]. Vein pattern is the network of human blood vessels esoteric a person's skin. The vein pattern can also be used to authenticate the identity of an individual. In the global network society, individuals can easily access their information anytime and anywhere, people are also facing with the risk that they have a fear that others can also easily access the same information anytime and anywhere [2]. The terrific growth in the demand for more user-friendly and secured biometrics systems has motivated researchers to discover new biometrics features and behaviors[10]. Finger vein is broadly measured as an auspicious biometric example for customized ID, getting bunches of medical, banking and business applications. Finger vein pattern recognition includes four principle techniques: image capturing, preprocessing, feature extraction and matching. Specifically, image capturing vision of veins in a finger it shows vein pattern. Through Preprocessing images can get improvised. Feature extraction distinguishes the qualities of the vein design from each individuals which represents and coordinates the similarity between two finger vein images for recognition. The benefits of finger vein recognition, is of identifying the correct individual [3]. The vein characteristics will remain unchanged for years which are everlasting but the thumb impression occurs some changes in after years [4].Here acquiring the image, preprocessing, segmentation, Representation and interpretation techniques are used for acquiring better results. Hand vein patterns are the vast network of blood vessels inside a person's skin. The vein patterns are unique from one individual to other and they are stable over a long period of time. It is invisible to human eye [8].Here Gabor filter is used for edge detection and extraction of finger vein patterns takes place for the identification of human.

EXISTING SYSTEM

In Existing methods different kinds of algorithm are implemented for finger identification using Radon transform based statistical features and probabilistic neural network classifier. Here the vein are tracked from the repeated line tracking algorithm. If the resolution of image is low means, the performance of the system is low. The segmentation of finger image is not performed well in the existing system.

PROPOSED SYSTEM



The above flowchart gives the clear image of identifying human by using vein pattern. Firstly, acquiring the image can be done using either a CCD camera, or a scanner. Preprocessing is the step taken before the major image processing task. Some basic task is to perform for the resulting image and them to proceed. In this case it may involve enhancing the contrast, removing noise, or identifying regions likely to contain the postcode. Segmentation is actually get the postcode; in other words the extraction of image that part of it. Which contains just the postcode. Representation and description refer extracting the particular features which help us to identifying objects. To distinguish the different digits which constitute a postcode by curves, holes and corners. Then assigning labels to objects based on their descriptors (i.e) recognition and interpretation (from the previous stand assigning meanings to those labels. So we identify particular digits, and we interpret a string of four digits at the end of the address as the postcode. In line tracking algorithm, the resolution of image is low, means the performance of the system is low. The segmentation of finger image is performed well in the existing system Includes ROI Extraction. In this module here we use the adaptive threshold segmentation. The image get segmented based on threshold value [6]. First we have to select a gray-level *T*. Between those two dominant levels, which will serve as a threshold to distinguish the two classes (objects and background). The natural choice for a threshold is 'T'. A new binary image can then be produced, in which painted completely black, and the remaining pixels are white with the help of threshold. Let the original image be $f(x, y)$, then the threshold product will be attained by scanning the original image, pixel by pixel, and testing each pixel against the selected threshold: the pixel is classified as an object pixel otherwise $f(x, y) > T$, then the pixel is classified as being a background pixel,. This can be summarized in the following definition, where $b(x, y)$ denotes the threshold binary image

$$b(x,y) = \begin{cases} 255, \text{if } f(x,y) > T \\ 0, \quad \text{if } f(x,y) \leq T \end{cases}$$

In the general case, a threshold is produced for each pixel in the original image; this threshold is then used to test the pixel against, and produce the desired result (in our case, a binary image).According to this, the general definition of a threshold can be written in the following manner:

$T = T\,[x, y, p(x, y), f(x, y)]$

Where $f(x, y)$ is the gray level of point (x, y) in the original image and $p(x, y)$ is some local property of this point (we shall explain this shortly). When T depends only on the gray-level at that point, then it degenerates into a simple global threshold (like the in the previous section). Special attention needs to be given to the factor $p(x, y)$. This was described as a property of the point. Actually, this is one of the more important components in the calculation of the threshold for a certain point. In order to take into consideration the influence of noise or illumination, the calculation of this property is usually based on an environment of the point at hand. An example of a property may be the average gray-level in a predefined environment, the center of which is the point at hand. Vein is segmented by the use maximum curvature. Maximum curvature method locates the position that possess the maximum curvature from the image profile, and the profile are acquired in different direction; while all points are extracted they are connected and combined according to the rules. Curvature refers to any of a number of loosely related concepts in different areas of geometry. Intuitively, the amount of deviate from being flat, or straight in the case of a lineof any geometric odject is known as curvature, but this is defined in different ways depending on the context. There is a key distinction between extrinsic curvature, which is defined for objects embedded in another space (usually a Euclidean space) in a way that relates to the radius of curvature of circles that touch the object, and intrinsiccurvature. Feature Extractionof the gabor filter for the input image. Gabor filters are similar to those of the human visual system, and they have been found to be particularly appropriate representation and discrimination. It is a linear filter used for edge detection.

Windowed Fourier Transform

$$F^{Fen}(\omega,\tau) = \int_{-\infty}^{+\infty} f(t)g(t-\tau)e^{-i\omega t}dt$$

Gaussion function as windowing function

$$G_f(\omega,\tau) = \int_{-\infty}^{+\infty} f(t)g_\alpha(t-\tau)e^{-i\omega t}dt$$

Gabor Transformation :

Orientation φ, Frequency f, Sigma (standard deviation of gaussian distribution)Selection of sigma involves a tradeoff. Larger values: more robust to noise but more likely to create spurious rings.Spurious rings will be produce with small values but less effective in removing noise[5].

Result

In this project, vein recognition is implemented with help of vein segmentation and feature extraction. These are used for identifying and matching with their individual pattern. This method can be used for mobile tracking, automated teller machine and it is for securing a tenable information.

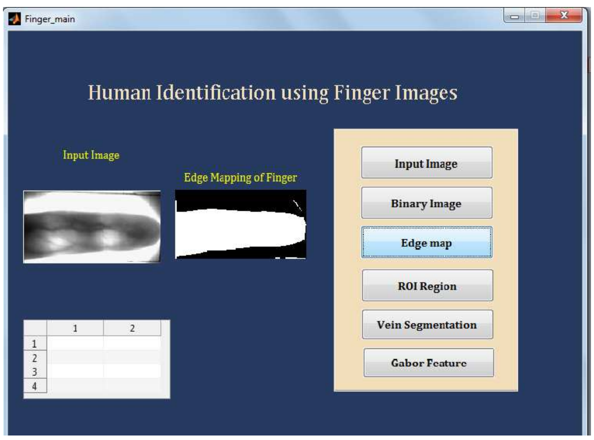


Fig 1(a)

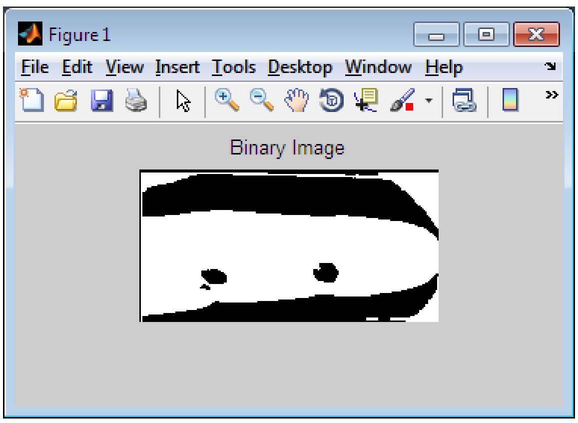


Fig 1(b)

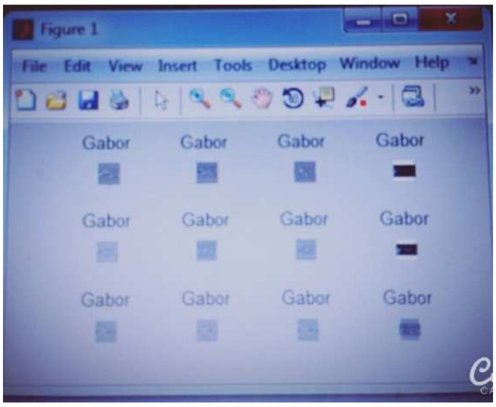


Fig 1(c)

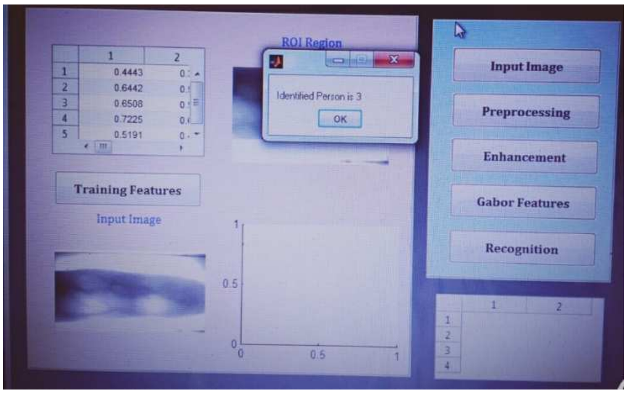


Fig 1(d)

Fig 1(a) gives the clear image getting edge mapping which is one of the extracting technique. Fig 1(b) represents the binary image. Fig 1(c) gives the aspects of Gabor features based on orientation and frequency. Fig 1(d) shows the identification of human using vein pattern, enhancement is to improve the quality of the image.

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