

Palm Authentication Using Biometric System

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Abstract:- Biometric authentication has been receiving much interest over the past decade with rising demands in automated personal identification. Biometric systems are superior because they provide a non-transferable means of identifying people not just cards or badges. Reliability and accuracy in personal authentication system is a dominant concern to the security world. Palm vein authentication technologies are one of the upcoming technologies which is highly secure. It is the world's very first contactless and personal identification system that uses the vein patterns in human palms to confirm a person's identity. The Palm Secure technology is designed in such a way that it can only detect the vein pattern of living people. The scanned process was extremely fast and does not involve any contact meaning that Palm Secure meets the stringent hygienic requirements that are normally necessary for use in public environments. Image fusion is the technology that combines several images of the same area or the same object under different imaging conditions. It is used to generate a result which describes the scene better than any single image with respect to relevant properties; it means the acquisition of perceptually important information. Palm prints are believed to have the critical properties of universality, uniqueness, and collectability for personal authentication. Palms are large in size and contain abundant features of different levels, such as creases, palm lines, texture, ridges, delta points and minutiae. Palms are more robust to damage and dirt.

Keywords:- Biometrics, Palm vein authentication, DCT, Walsh, Hybrid, EDT, Threshold value.

I. INTRODUCTION

Biometric authentication has been receiving much interest over the past decade with rising demands in automated personal identification. Reliability and accuracy in personal authentication system is a dominant concern to the security world. Biometric systems are superior because they provide a non-transferable means of identifying people not just cards and badges. The key point is all about of an identification method that is "non-transferable" means it cannot be given or lent to another individual so nobody can get around the system - they personally have to go through the control point .

The fundamentals of biometrics are that they are things about a person: Measurable - things that can be counted as well as numbered or otherwise quantified, the Physiological characteristics - like height, eye color, fingerprint, DNA etc. and Behavioral characteristics - such as the way a person moves, walks, types . Among many biometric techniques, palm print recognition is one of the most trustworthy approaches. Palm vein pattern authentication is the first contactless technology that uses vascular patterns as personal identification data.

Palm print identification and verification is an innovative endeavor especially in academic research field. Palm print provides abundant and stable attributes, such as principal lines, wrinkles, minutiae, delta points, etc., to palm print recognition system. Palm prints are believed to have the critical properties of universality, uniqueness, and collectability for personal authentication. Palms are large in size and contain abundant features of different levels, such as creases, palm lines, texture, ridges, delta points and minutiae. Palms are more robust to damage and dirt. In this ubiquitous network culture, where individuals can easily access their information anytime and anywhere, they also can face the risk that others might easily access the same information anytime and from anywhere. Due to this risk, personal identification technology which distinguishes between registered legitimate users and imposters is now coming into the picture. Currently, passwords, Personal Identification Numbers (4-digit PIN numbers) or identification cards are used for personal identification. However, cards can be stolen, and passwords and numbers can be guessed or forgotten.

Hence to solve such kind of problems, biometric authentication technology, which is one among the best identifies people by their unique and very distinct features of biological information, is seeking the attention of every user. In biometric authentication, an account holder's or the registered user bodies the characteristics or behaviors (habits) of the human being's are registered in a database and then compared with others who may try to access that account to see if the attempt is legitimate.

II. METHODOLOGY

The Palm vein authentication design and implementation is done using the following algorithms:

1. Hybrid approach
2. Edge detection histogram approach

III. HYBRID APPROACH

Absolute value is less than threshold value then print match is found else match is not found. If match is found then calculate the Euclidean distance and display the match.

The Kekre's hybrid transform is generated by combination of two basic matrices like namely Discrete Cosine Transformation and Walsh as well as Kekre's transform and Hartley transform which world is widely known. Kekre's hybrid wavelet transform is generated by using two input matrices so that best qualities of both of the matrices can be incorporated into hybrid matrix. The matrix which has one of the major advantage is that it can be used for images which are not integer power of 2. Image fusion combines two or more images of same object or scene so that the final output image contains more information . There are several situations in which image processing require high spatial and high spectral resolution in a single image. In image fusion process the most significant features in the input images are identified and transferred them without loss into the fused image. Here basically the direct cosines transform and Walsh transform matrix is used to obtain the hybrid matrix.

IV. EDGE DETECTION HISTOGRAM

Edges in images constitute an important feature to represent their content. Also, the human eyes which are very sensitive to edge features for image perception. The edge histogram is very useful for indexing and retrieving images. One way of representing such an important edge feature i.e.EHD is to use a histogram. An edge histogram in the image space which represents the frequency and the directionality of the brightness changes in the image. It is a unique feature of the images, which in any case cannot be duplicated by a color histogram or the homogeneous texture features.

V. PROPOSED ALGORITHM

Take the input image. Check if the image is of 128*128 sizes. If not then convert it into the size and if it is of appropriate size then mark it as a test image. Now generate two DCT matrix and Walsh transform matrix: DCT is a 8*8 matrix size & Walsh transform is a 16*16 matrix size. Then generate the hybrid matrix using fusion techniques on both DCT and Walsh Matrix. After this feature extraction is done by edge histogram descriptor. Using hybrid transform matrix and trained set. Check for threshold value – If

VI. ADVANTAGES

Palm print offers advantages: non-intrusive, low resolution imaging, user-friendly, moderate price capture devices, stable and distinct feature In addition to the palm, the vein technology which authenticates can be done using the vascular pattern on the back of the hand or a finger. Vein patterns are unique to individuals and contain detailed characteristics for formulation of algorithm .However; the palm vein pattern is the most complex and covers the widest area. Because the palm which has no hair, it becomes much easier to photograph its vascular pattern of the palm. The palm also has no significant variations in skin colour compared with fingers or the back of the hand, where the colour can darken in certain areas. Vein recognition technology is secure because the authentication data exists inside the body and is therefore very difficult to forge. Contactless authentication is hygienic and non-invasive, thus promoting the high-level of acceptance of any user. Advanced authentication algorithm produces high level of accuracy and application versatility

VII. CONCLUSION

Palm vein technology is highly secure because it uses information contained within the body and is also highly accurate because the pattern of veins in the palm is complex and unique to each individual. In addition to this, its contactless feature gives it a hygienic advantage over other biometric authentication technologies.

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