PALM VEIN RECOGNITION USING LOCAL TETRA PATTERN

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ABSTRACT

In many fields for personal identification passwords, Personal Identification Numbers (4-digit PIN numbers) or identity cards are used. Hence, there are chances that card may stole; password can be hacked or forgotten. So to solve these problems, Biometrics (biological identification) comes into existence. Palm vein structure is unique for every human even for the twins also. Palm vein authentication has a high level of authentication accuracy due to the uniqueness and complexity of vein patterns of the palm. Because the vein patterns of palm are internal to the body, they are an impossible to forge. To verify identity, proposed method is developed. The proposed approach formulates the relationship between the reference or centre pixel and its neighbours, considering the calculated vertical and horizontal directions. Image enhancement, ROI, feature extraction, similarity check are used for local tetra pattern.

Keywords: Biometric, Palm vein authentication, Local Tetra Pattern.

I. INTRODUCTION

Biometrics is a growing technology in which the person is recognizing based on physiological characteristic. Biometrics focused on face, fingerprints, hand geometry, handwriting, iris, retinal, vein, and voice methods. Advantage of using biometric authentication is, person's physical characteristics is constant throughout one's lifetime and are difficult to change. Some methods have the inherent advantage and disadvantages. Any person can easily access their information anytime and anywhere, people are also facing the problem that others can easily access their information like password anytime and anywhere. Because of this problem, personal authentication technology, which can distinguish between registered legitimate users and forged user, is now generating interest. Now a days, passwords, Personal Identification Numbers (4-digit PIN numbers) or identification cards are used for personal authentication. However, identification cards can be lost somewhere, and passwords and numbers can be forged or forgot. To solve these problems, biometric identification technology, which identifies people by their unique biological characteristics, is attracting people attention. In compared with the person traits who may biometric authentication, legitimate user body characteristics, behavior or body part image are registered in a database and try to access that account. Characteristics are compared to check that if the access is by the same or legitimate person or not.

In biometric recognition system fingerprint, face recognition and palm vein recognition are popular techniques. In facial recognition, the face can be obstructed by hair, glasses, hats, and facial characteristics can vary

according to lighting conditions, which produces performance degradation. Fingerprint recognition is also a widely used authentication technique, but the contact acquisition mode, requiring contact with a sensor, and result in user resistance. In the case of iris recognition, an application requires high security requirements, but the cost of the image scanner may not be affordable for some civilian scenarios. Some intrinsic characteristics, such as DNA and palm vein patterns, are more effective techniques than others because they are deep in the body and difficult to acquire. Hence, proposes palm vein technique which protects against possible external damage, spoof attacks, etc [4]. For high security purpose palm vein recognition is used and for detailed extraction of information Local Tetra Pattern (LTrP) [1] is preferred.

II. METHODOLOGY

In the proposed work, palm vein recognition method uses images of human palm vein patterns present beneath the skin. We enhance the image and then it will be given to LTrP. Feature extraction will be done. In this algorithm, we calculate direction of every pixel. Retrieval of the images based on the best matches will be done through Local Tetra Pattern.

Palm vein authentication is our proposed system. This paper gives idea about detection system. Fig(a) gives idea about proposed work system. First we have to enroll the database. Input image taken for the system. According to system requirement, sample image (input image) is resized to appropriate dimensions, this is the image enhancement.. After enhancing the image, this image is given to local tetra pattern as input. After that, comparison will be taken between the input image and the images in the database.

 Local tetra pattern works as: Input image is converted into gray scale. Then first order derivative will be applied in horizontal and vertical direction. And direction of pixel will be calculated. Based on the direction of centre pixel, we have to divide the patterns into four parts. Then we calculate the tetra pattern and separate them into three binary patterns. Then calculate histograms of binary pattern and then calculate magnitude of centre pixel. After that calculate the binary patterns and calculate their histograms. Then we combine calculated histograms. Then we construct feature vector.
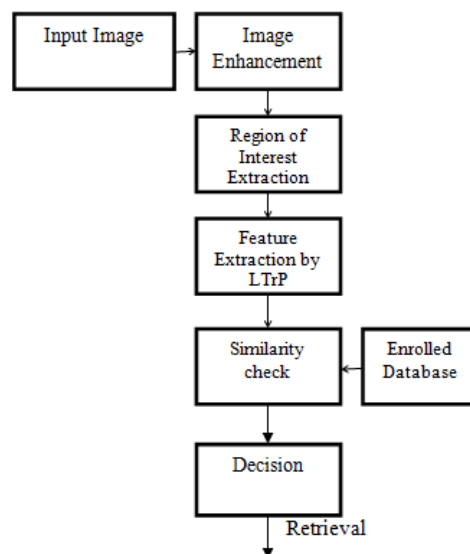

Fig a: Block diagram of proposed system

REFERENCES

[1]   S. Murala, R. P. Maheshwari, and R. Balasubramanian. "Local tetra patterns: A new feature descriptor for content-based image retrieval". *Image Processing, IEEE Transactions on, 21(5):2874–2886*, may 2012.

[2]   R. Kabaciński, M. Kowalski, "Vein pattern database and benchmark results", *Electronics Letters, Volume: 47 Issue: 20, 1127 - 1128,* 2011.

[3]   B. Zhang, Y. Gao, S. Zhao, and J. Liu, "Local derivative pattern versus local binary pattern: Face recognition with higher-order local pattern descriptor," *IEEE Trans. Image Process., vol. 19, no. 2, pp. 533–544,* Feb. 2010.

[4]   Wenxiong Kang, and Qiuxia Wu, "Contactless palm vein recognition using a mutual foreground-based local binary pattern", *IEEE transactions on Information Forensics and Security, 2014, ISSN: 1556-6013.*

[5]   Ujwala D. Podgantwar, and Prof. U. K. Raut, "Extraction of finger vein patterns using gabor filter in finger vein image profiles", *IJERT, Vol. 2 Issue 6, June – 2013, ISSN: 2278-0181.*

[6]   T. Ojala, M. Pietikainen, and T. Maenpaa, "Multiresolution gray-scale and rotation invariant texture classification with local binary patterns," *IEEE Trans. Pattern Anal. Mach. Intell., vol. 24, no. 7, pp. 971–987,* Jul. 2002.

[7]   X. Tan and B. Triggs, "Enhanced local texture feature sets for face recognition under difficult lighting conditions," *IEEE Trans. Image Process., vol. 19, no. 6, pp. 1635– 1650,* Jun. 2010.

[8]   Mirmohamadsadeghi, L. and Drygajlo, A., "Palm vein recognition with local texture patterns", *Biometrics, IET (Volume: 3, Issue: 4), ISSN: 2047-4938.*

[9]   Setiawan, A.W.; Mengko, T.R.; Santoso, O.S. and Suksmono, A.B.,"Color retinal image enhancement using CLAHE", *ICT for Smart Society (ICISS), 2013, ISBN: 978-1-4799-0143-2.*

[10] Parihar, A.S.; Verma, O.P. and Tyagi, S.,"An optimal fuzzy filter for Gaussian noise in color images using bacterial foraging algorithm", *Emerging Research Areas and 2013 International Conference on Microelectronics, Communications and Renewable Energy (AICERA/ICMiCR), 2013, ISBN: 978-1-4673-5150-8.*

[11] Xuekui Yan, Feiqi Deng, and Wenxiong Kang, "Palm vein recognition based on multi-algorithm and score level fusion", *Seventh Internation Symposium on Computational Intelligence and Design (ISCID), 2014, ISBN: 978-1-4799-7004-9.*

[12] Li peidan, Miao Zhenjiang, and Wang Zhiqun, "Fusion of palm print and palm vein images for person recognition", *12th International Conference on Signal Processing (ICSP), 2014, ISBN: 978-1-4799-2188-1.*

[13] G. Zhao and M. Pietikainen, "Dynamic texture recognition using local binary patterns with an application to facial expressions," *IEEE Trans.Pattern Anal. Mach. Intell., vol. 29, no. 6, pp. 915–928,* Jun. 2007.

[14] W. Yang.C. Qin, X.Wang, Q.Liao, "Cross section binary coding for fusion of finger Vein and finger dorsal tetxture", *IEEE International Conference on Industrial Technology(ICIT), PP.742-745,*2016.