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Review On: Finger Vein Recognition Using Discrete Wavelet Packet Transform Based Features

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Abstract: *Finger vein is a distinctive biometric method for identification of individuals based on the physical characteristics and parameters of the vein patterns in the human. This method of personal identification have been attracting attention in forensics and civilian applications such as crime detection, banking, physical access control, information system security, national ID systems and voter and driver registration. Finger vein biometric is considered unique and reliable because every individual has different veins pattern. This paper discusses a novel technique for finger veins features extraction using Repeated Line Tracking; Discrete Wavelet Packet Transform with Segmentation based method. The DWPT without HH sub and decomposition is applied on ROI of 96x64 size finger veins image up to third level. The performance of proposed method is evaluated on the standard finger veins image ROI database of SDUMLA Shandong University. Experimental results show that the suggested method yields better results as compared to the standard Discrete Wavelet Transform (DWT) and DWPT Methods.*

Keywords: *Finger Vein Recognition; Biometrics; Discrete Wavelet Transform; Discrete Wavelet Packet Transform; Segmentation, Repeated Line Tracking.*

I. INTRODUCTION

In this paper, we concentrate on three different approaches i.e. Discrete Wavelet Packet Transform (DWPT) which decomposes the input image into four sub bands such as LL, LH, HL and HH. It also uses line tracking at various positions. Local black lines are recognized and line tracking is processed by moving along the lines, pixel by pixel. With repeated operations, the veins are fully emphasized. With Segmentation, we subdivide an image into its constituent regions to improve the subjective quality of images.

The acquired images are first subjected to preprocessing steps that include:

1) ROI Segmentation.
2) Orientation and translation alignment.
3) Image enhancement to extract stable/reliable vascular patterns.

The block diagram of the DWPT suband decomposition is shown in Figure1.1.

<table>
<tr><td>LL 3</td><td>LH 3</td><td rowspan="2">LH2</td><td rowspan="3">LH1</td></tr>
<tr><td>HL 3</td><td>HH 3</td></tr>
<tr><td colspan="2">HL2</td><td>HH2</td></tr>
<tr><td colspan="3">HL1</td><td>HH1</td></tr>
</table>

Figure 1.1 3rd Level Discrete Wavelet Transform Decomposition

Steps to be followed for personal identification using finger vein pattern:-

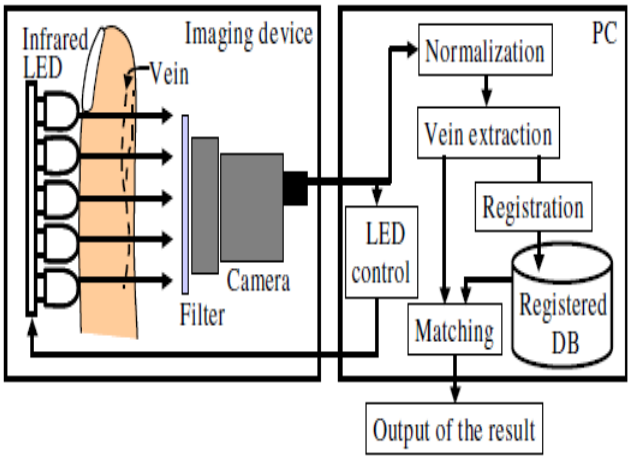
Step 1: Acquisition of an infrared image of finger.

Step 2: Normalization of an image: In order to achieve high accuracy in finger vein image matching, the original image is normalized into smaller size.

Step 3:Extraction of finger vein patterns

Step 4: Matching

Step 5: Output of result of identification



II. LITERATURE SURVEY

N. Miura,A. Nagasaka, and T. Miyatake developed a revised line tracking which extracts finger vein pattern from the unclear image by using line tracking at various position

Yanagawa, T.; Aoki, S.; Ohyama analyzed that human finger vein images are diverse and its patterns are useful for personal identification.
Lee, E.C.; Jung, H.; Kim, devised a new finger biometric method using near infrared imaging sensors.

Mulyono and H. S. Jinn suggested finger vein biometric for personal identification.

III. PROPOSED WORK

*I propose an enhanced Human Identification algorithm Using Finger Vein which is based on Repeated Line Tracking, Discrete Wavelet Packet Transform with Segmentation.

*I propose enhanced Human Identification Using Finger Vein algorithm which will be more accurate with respect to other Human Identification Using Finger Vein Technique.

*I propose enhanced Human Identification Using Finger Vein algorithm which will be fast and will thus save time in comparison to other techniques.

*I use enhanced Human Identification Using Finger Vein algorithm thus providing high tier security.

IV. CONCLUSION

In this paper, for finger vein recognition, we have proposed various techniques like use of DWT with repeated line tracking. The different techniques used to get the better result for accuracy will use MATLAB which will reduce the length of feature vector and will greatly increase the recognition accuracy compared to other different methods.

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