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# High Efficient Palm Print Recognition Based on Curvelet Transform

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***Abstract*— : In recent years, palm print identification technology has been widely carried out and used in fields such as identity recognition. At the same time traditional methods have more computational complexity and low accuracy. By using curvelet transform on decision fusion, the computational complexity and low accuracy is to be reduced. In this proposed method the computational time reduces the previous methods of palm print recognition and precision of the features are increased, to denoise the image using curvelet transform on decision fusion is better than previous technologies.Here the system has more prediction of image accuracy and computational time. The palm print recognition precision of the features are increased to overcome the disadvantages.**

***Index Terms*— Palm Print Recognition, Decision Fusion, Computational Complexity, Relationship Curve(RC)**
.

## I. INTRODUCTION

Curvelet transform is the representation of curves sparesly. The curvelet transform is mainly used for representation of most sparse curves. The main feature of palm print images have most sparse curves and several curves respectively. The curvelet transform deals with PCA (Primitive Calculate Analysis) for the scale and dimensions and it sends to RBF neural network, through the RBF neural network we can receive palm print images with most sparse curves representation also.

Computational process and Accuracy have much important in this recognition. For this recognition, it has high computational complexity and low accuracy in this recognition when it compares to original image .This low accuracy and computational complexity have to be reduced .Due to the help of PCA we can get the scales and dimensions of several curves easily. The RBF neural network can easily receive the scales and dimensions but the PCA must have a correct scales and dimensions of between several curves before it is going to be transmitted.

After receiving the original scales and dimensions of original image the RBF neural network will construct the four layers for the representation of several curves and sparse curves respectively .

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In this paper describes about the reduction of computational complexity and increase the accuracy of palm print images by using curvelet transform on decision fusion. be eliminated.

## II. PROPOSED MECHANISM

In this proposed paper we are using the same 2nd generation of curvelet transform but by reducing the response time the computational complexity is greatly reduced. The following figure shows the block diagram of curvelet transform.

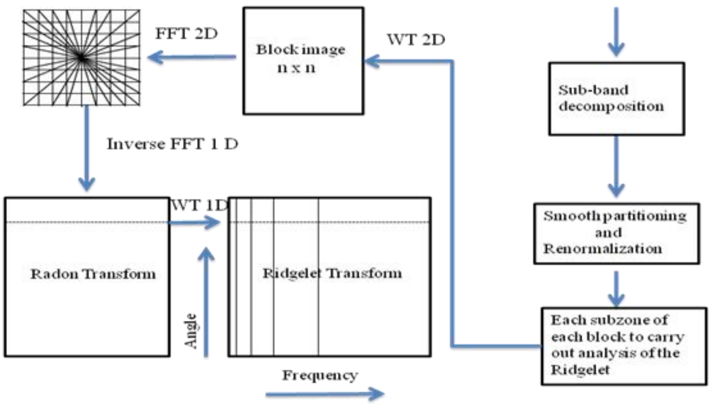


Figure 1. Block diagram

### A. RBF NEURAL NETWORK

This RBF(Radial basis function) receives the scales and dimensions of several curves from the PCA(Primitive calculate analysis).The RBF neural network will do the following three functions

1. Extracting eigenvector on rough scale
2. Extracting 2nd layer eigenvector in curvelet domain
3. Extracting 3rd layer eigenvector in curvelet domain

1.Extracting eigenvector on rough scale

From the scales and dimensions of PCA it can create the rough scale of example for the palm print image size if 128*128 it will Carry out curvelet transform to get the 1st layer's coefficients, make32*32 coefficients transformed as feature information and do them in a series connection from left to right as shown in figure 2


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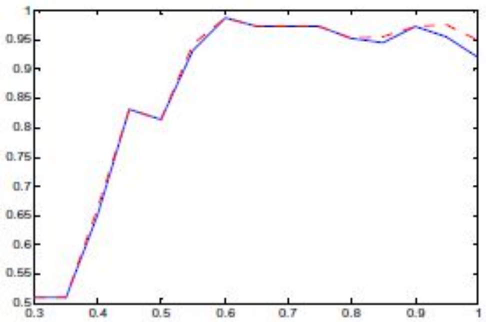

Figure 2: RC of 1st layer

2. Extracting the 2nd layer eigenvector in curvelet domain

It will perform the pixels of the character figure series connections from left t right and trest htem as the Eigen vector (size of 16384).It will finally send them to the RBF network for classifier training or recognition as shown in figure 3

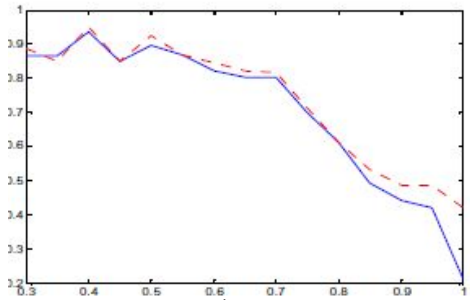

Figure 3:RC of 2nd layer.

3. Extracting the 3rd layer eigenvector in curvelet domain

First it will reduce the noiseand get character image after reverse transformand carry out binarization processing (size of 128*128)and divide the image into 4*4 of be adjacent to but not overlapping .Statistic pixels' sum of eachblock .Then extract eigenvector by series connection from left to right (size of 1024)and finally carry out dimension reduction by PCA. Finally, send them to RBF network for classifier training or recognition as shown in figure[4]

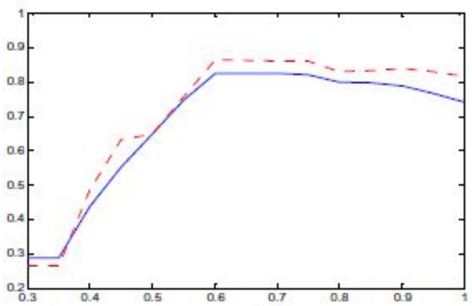

Figure 4:RC of 3rd layer

B.CURVELAB TOOLBOX

Curve Lab is a collection of Matlab and C++ programs for the Fast Discrete Curvelet Transform in two and three dimensions. With the help of This tool box the calculation process of scales and dimensions are greatly reduced .For this Curvelet transform we can the desired output by the following Matlab code, first it loads the responsible palm image and use the parameters of curvelet transform and also execute it for the three functions of RBF neural network,

**Parameters for the curvelet transform.**

```
options.null = 0;
options.finest = 1;
options.nbscales = 4;
options.nbangles_coarse = 16;
options.is_real = 1;
options.n = n;
```

**Perform the transform.**

```
MW     =     perform_curvelet_transform(M,
options);
```

**Display the transform.**

```
clf;
plot_curvelet(MW, options);
```

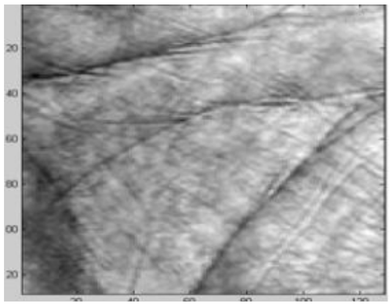

Figure 5:Original image

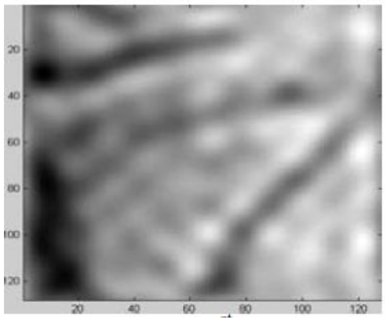

Figure 6:First layer

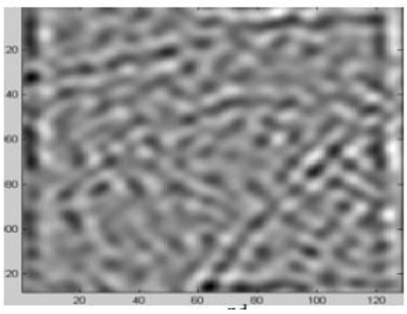

Figure 7:Second layer



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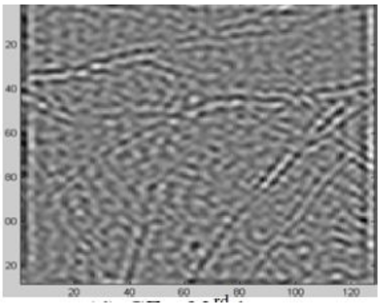

Figure 8:Third layer

we can get the result of received palm print images of extraction of three layers respectively.

From this output we can also create the de noise image by using curvelab matlab toolbox, it produces the image with denoised output. Also equalize the image with histogram equalization .

## III. CONCLUSION

In this output we get the sparse lines and principle lines of the palm print image with low response time and high accuracy than the second generation curvelet transform. In future work we will create a fourth layer for accuracy high and multi-spectral of palm print image to capture sensitive image under illumination, including Red,Green,Blue and Infrared by using competitive coding scheme for matching algorithm.

## REFERENCES

[1] D.L.Donoho,M.R.Duncan. Digital curvelet transform: strategy, implementation and experiments.Proc.Aerosense 2000,Wavelet Application VII.SPIE, 2000, 4056, 12-29.

[2] E.J.Candès. D.L.Donoho. Curvelet, multi-resolution representation and scaling laws. In: Proc.SPIE.San Jose, CA: SPIE Press, 2000.1-12.

[3] Pan Lideng, Improvement and realization of RBFNN OLS algorithm, *Journal of Beijing university of chemical technology*,vol.29, No.4, 2002.

[4] X. Q. Wu, K. Q. Wang, and D. Zhang. Palmprint Recognition Using Valley Features. Proceedings of 2005 International Conference on Machine Learning and Cybernetics, Guangzhou, China, 2005: 4881-4885.

[5] X. Wei, D. Xu, and G. Yuan. Authorization Based on Palmprint. Proceedings of ICIC 2005, Hefei, China, 2005: 174-183.

[6] D. Zhang and W. Shu. Two Novel Characteristics in Palmprint Verification: Datum Point Invariance and Line Feature Matching. Pattern Recognition, 1999, 32(4): 691-702.

[7] CANDES E J , DEMANET L, DONOHO D L, YI NG Lexing . Fast discrete curvelet transforms. Multiscale Modeling Simulation, 2005, 5 (3) : 861-899 .

[8] E.J.Candès .Ridgelets: Theory and application: [Ph.D. disseration], Department of Statistics, Stanford University, 1998.

[9] Sun Yigang, A Useful Method for the Training of Radial Basis Function Neural Networks, Journal of Harbin Institute of Technology, vol.29(4), pp.103-106, 1997



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