ISSN:0975-9646
Ruchika Gupta et al, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 2 (4) , 2011, 1753-1755

Generation of Iris Template for recognition of Iris in Efficient Manner

Ruchika Gupta[1] Harish Saini[2]

CSE,Kurukshetra

H.No-1805 Sector-15 H.B.C Sonipat, Haryana(India)

***Abstract* - To find a fast, effective iris template aimed at speeding up the iris localization, normalization and feature extraction process and increasing their precision. Iris localization is the main part of any iris recognition system as the success of any Biometrics system depends on the accurate and effective i.e. less time-consuming localization method. Further, iris detection is a computationally intensive task in the overall iris biometric processing.**

The Paper discusses how different algorithm's function can be used in finding an innovative solution for iris image acquisition. Using an efficient localization, normalization and encoding algorithm may achieve the said objective for our problem. The algorithm requires iris image database of individuals. Dougman's function is used for localization, rubber sheet model for normalization and labor masek feature extraction function for fast and effective iris detection.

***Keywords*-Biometrics,localization,Normalization, Template, feature extraction.**

I. INTRODUCTION

With the rapid advancement of computer technology, the use of computer-based technologies is increasing in different fields of life. Image acquisition is an important problem in different fields of image processing and computer vision. Image reproduction is the largest application of electronic image acquisition systems. A biometric system provides automatic recognition of an individual based on some sort of unique feature or characteristic possessed by the individual. Biometric systems work by first capturing a sample of the feature or from the database the sample is then transformed using some sort of mathematical function into a biometric template. The biometric template will provide a normalized, efficient and highly discriminating representation of the feature, which can then be objectively compared with other templates in order to determine identity.

A template is a synthesis of the relevant characteristics extracted from the source. Elements of the biometric measurement that are not used in the comparison algorithm are discarded in the template to reduce the file size and to protect the identity of the enrollee.

The objective will be to implement an open-source iris recognition system in order to verify the claimed performance of the technology. The development tool used will be MATLAB®, and emphasis will be only on the software for performing recognition, and not hardware for capturing an eye image.

II. ALGORITHM USED IN THE PAPER

Image Processing Toolbox software provides a comprehensive set of reference-standard algorithms and graphical tools for image processing, analysis, visualization, and algorithm development. Restore noisy or degraded images, enhance images for improved intelligibility, extract features, analyze shapes and textures, and register images. Most toolbox functions are written in the open MATLAB language, giving us the ability to inspect the algorithms, modify the source code, and create our own custom functions. Capabilities of Image Processing Toolbox can be extended by writing our own M-files, or by using the toolbox in combination with other toolboxes. Algorithm develops in MATLAB to detect edges and correlate it with stored images. Filter the image to reduce noise. And to detect and analyze multiple Iris data images. Algorithm also used to enhance the intensity of acquired image.

III. METHODOLOGOLY

LOCALILIZATION

Inner boundary and the outer boundary of a typical iris can be taken as circles. The two circles are usually not co-centric. Compared with the other part of the eye, the pupil is much darker. We detect the inner boundary between the pupil and the iris. The outer boundary of the iris is more difficult to detect because of the low contrast between the two sides of the boundary.

Pre-processing

Pupil boundary detection

Iris boundary detection

NORMALIZATION

The size of the pupil may change due to the variation of the illumination and the associated elastic deformations in the iris texture may interface with the results of pattern matching. For the purpose of accurate texture analysis, it is necessary to compensate this deformation. It is easy to map the iris ring to a rectangular block of texture of a fixed size. Normalization refers to preparing a segmented iris image for the feature extraction process.

IMAGE ENHANCEMENT

The original image has low contrast and may have non-uniform illumination caused by the position of the light source. These may impair the result of the texture analysis. We enhance the iris image reduce the effect of non-uniform illumination

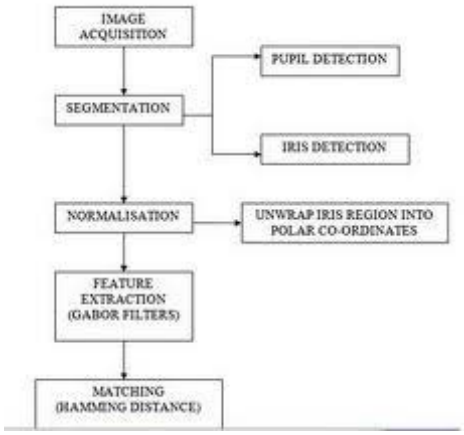

Figure 1. Showing the basic steps of the iris recognition process

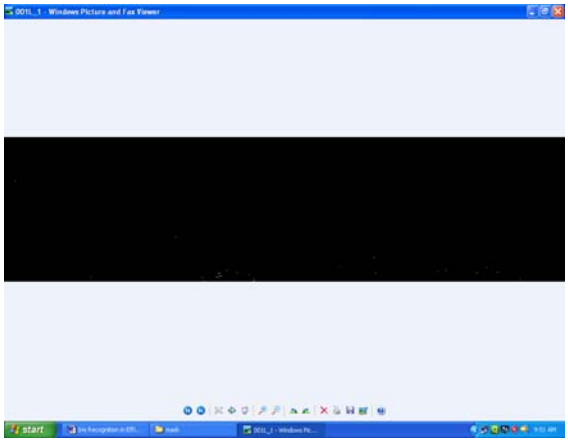

Figure 1. Mask of the iris

IV. RESULT

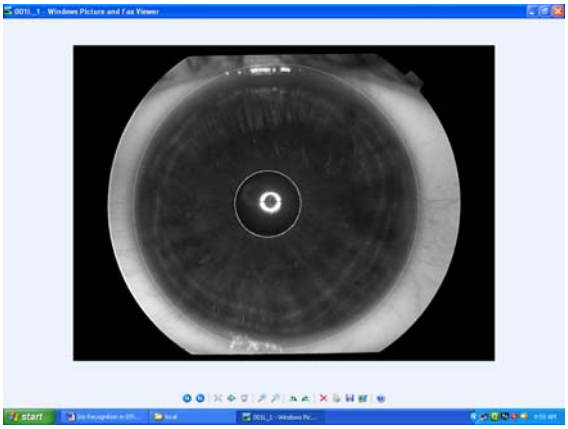

Figure 1. Iris localization image

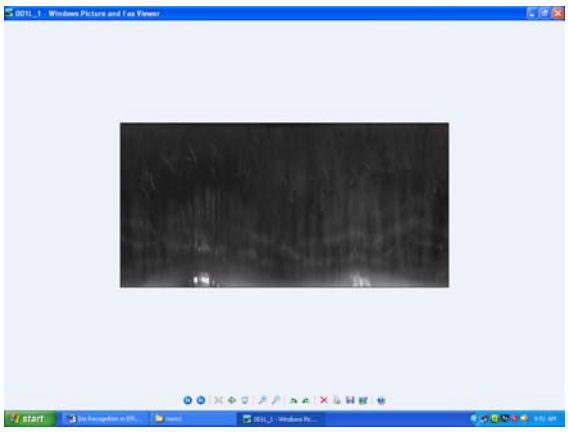

Figure 1. Normalization of iris

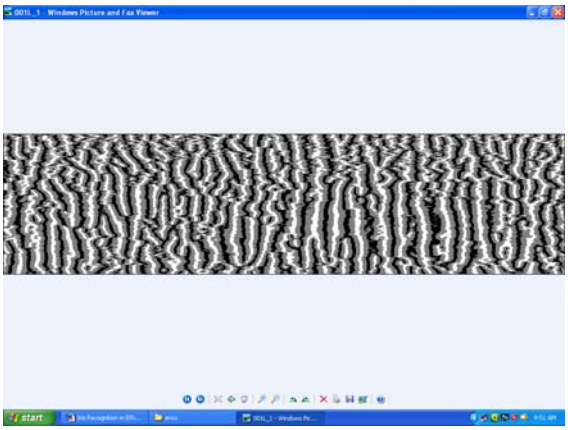

Figure 1. Iris encoded image

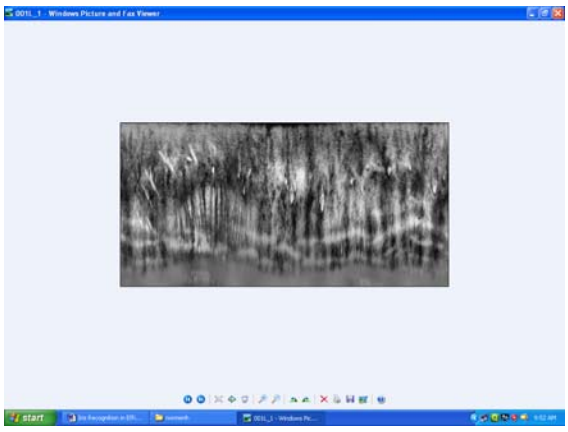

Figure 1. Enhancement of normalization

V. CONCLUSION

It has emerged as a robust and reliable biometric technology that gives good matching accuracy even from a distance. So far, there are many algorithms for the purpose, but are generally tested on stored iris images from CASIA and UPOL databases. An attempt has been made in this work to capture iris images from database and to reliably localize its position in real time. Algorithm developed in MATLAB successfully acquires and stores template of human eye. Edges are effectively identified on the acquired and enhanced eye images.

VI. REFERENCES

[[1] Arun Ross, "IRIS RECOGNITION: THE PATH FORWARD". Published by the IEEE Computer Society, February2010, 0018-9162/10.pp 30-35

[2].BRIAN A.WANDELL, ABBAS EL GAMAL, BERND GIROD, "Common Principles of Image Acquisition Systems and Biological Vision'', Proceedings of IEEE VOL. 90, No. 1, January 2002

[3]Henryk BLASINSKY, Frederic AMIELA, Thomas EA, Florence ROSSANT, Beata MIKOVICOVA, "Implementation and Evaluation of Power Consumption of an Iris Pre-processing Algorithm on Modern FPGA'', RADIOENGINEERING, VOL. 17, NO. 4, DECEMBER 2008.pp 108-114

[4]H.Proenca and L.A.Alexandre, "Iris segmentation methodology for non-cooperative recognition'', IEE Proc.-Vis. Image Signal Process., Vol. 153, No.2, April 2006.pp 195-205.

[5] James R. Matey, Oleg Naroditsky, Keith Hanna, Ray Kolczynski, Dominick J. LoIacono, Shakuntala Mangru, Michael Tinker, Thomas M. Zappia, and Wenyi Y. Zhao, "Iris on the Move: Acquisition of Images for Iris Recognition in Less Constrained Environments", Proceedings of the IEEE, Vol. 94, No. 11, November 2006.pp 1936-1947.

[6]J. Daugman, "High confidence visual recognition of persons by a test of statistical independence", IEEE Trans. Pattern Anal. Mach. Intell. 15 (11) (1993) 1148–1161.

[7] J. Daugman, "The importance of being random: statistical principles of iris recognition'', Pattern Recognition 36 (2003) The Journal of the Pattern Recognition Society. Published by Elsevier Science Ltd.pp279 – 291

[8] John Daugman. "How iris recognition works". IEEE transactions on circuits and systems for video technology, vol. 14, no. 1, January 2004. pp 21-30.

[9] John Daugman, "Probing the Uniqueness and Randomness of Iris Codes: Results from 200 Billion Iris Pair Comparisons". Proceedings of IEEE 2006, Vol. 94, No. 11, November 2006, 0018-9219pp 1927-1935

[10] John Daugman, "New Methods in Iris Recognition", IEEE transactions on systems, man, and cybernetics—part b: cybernetics, vol. 37, no. 5, October 2007.pp 1167-1175.

[11]Linhua Jiang, Ying Zhang, Wei Li, "A Novel Iris Location Method for Fast Iris Recognition'', IEEE 2009 Proceedings 978-1-4244-4131-0/09

[12] Luis M.Bergasa, Jesus Nuevo, Miguel A.Sotelo, Manuel Vazquez, "Real-Time System for Monitoring Driver Vigilance", IEEE Intelligent Vehicles Symposium 2004

[13] Malik Sikander Hayat Khiyal, Aihab Khan and Amna Bibi,"Modified Watershed Algorithm for Segmentation of 2D Images", Issues in Informing Science and Information Technology "Volume 6, 2009.

[14] Oi Mean Foong, Tan Jung Low, and Satrio Wibowo,"Hand Gesture Recognition: Sign to Voice System (S2V), International Journal of Electrical, Computer, and Systems Engineering 3:4 2009.pp 198-202.

[15] Rajesh Bodade, Sanjay Talbar, "Dynamic Iris Localisation: A Novel Approach suitable for Fake Iris Detection '', IEEE 2009 Proceedings 9781-4244-3941-6/09