

Chapter 37

Human Health Diagnosis System Based on Iris Features

Poonguzhali N

Pondicherry Engineering College, India

M. Ezhilarasan

Pondicherry Engineering College, India

R. Hariharan

Pondicherry Engineering College, India

N. Praveen Devaraajan

Pondicherry Engineering College, India

ABSTRACT

Iris feature has been used in authentication systems in many real time applications and is proved to provide high accuracy. Apart from authentication iris features can also be used for detecting pathological changes in human body and diagnose human health. The present study analyses the relationship between human iris anatomy and their health, as it is proved that changes in human health condition reflects the iris. Basically, in authentication system iris texture features are used for identification, in the proposed work iris texture and geometric features can also be deployed in diagnosing human health. The texture features present in the human iris are extracted using the mathematical statistical measure which is used to specify the characteristics of the texture of an image using gray-level co-occurrence matrix. The iris and pupil are extracted and correlated to the compactness features of the circle. Based on the comparison the system enables in prediction of abnormalities in the iris texture and identifies the affected person.

INTRODUCTION

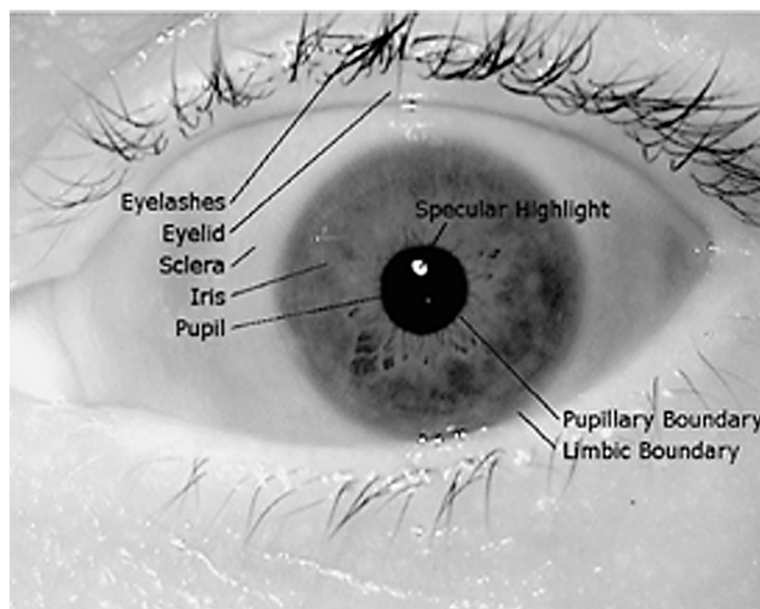
A biometric system inculcates automatic recognition of a person on the basis of some characteristic or unique feature possessed by the individual, on whom some identification processes are carried out (Wildes 1997). There are various types of biometric system, which are based on hand geometry, handwriting, facial features, fingerprints, voice, retina, iris (Sanderson & Erbetta 2000). Iris biometric is said to be

DOI: 10.4018/978-1-5225-5204-8.ch037

the feature that is highly unique and accurate, so the chances of any two individuals having the similar characteristic will be minimal and it will never change during one's life time. The current state-of-art of iris technologies in biometric are used for recognition system. This study is an attempt on iris biometric trait for the prediction of diseases or pathological organs in human body. In early days, iridology was a branch of science for iris diagnosis of human anatomy and used to diagnose disease based on manual investigation of iris texture pattern. Hence the system is automated using image processing techniques. The iris biometrics was generally used for authentication purpose, but in this paper, the approach is towards using the iris biometrics as a means for iris diagnosis. The iris is an annular part between the pupil and sclera, which is externally visible in an eye as shown in Figure 1.

Iris consists of two parts, the inner part is the pupillary zone and the outer part is the ciliary zone, which are divided by a zigzag pattern region called collarette (Adler, 1965). These characteristic features make it very useful for identifying the individuals (Daugman, 1994), (Boles & Boashash 1998). Image processing techniques can be implemented to bring out the discreet iris pattern and to encode them into a biometric template. The biometric template is later stored in a database. This template of the biometric consists of quiet a few mathematical representation of the uniqueness of the iris, and allows comparisons to be done between templates. When an individual is to be identified by an iris biometric recognition system, the input human eye image is captured using sensors and a template is created for the iris region of the eye. This template is subjected to comparison with other templates, which are previously stored and either a matching is found, on identifying a person or a matching is note found. Iris recognitions is generally considered as the most unique, reliable and high accuracy form of biometric technology, compared to finger prints, voice, face and other form of recognitions. The iris biometric system is said to undergo various processing techniques of image processing such as segmentation, normalisation, encoding and matching.

Figure 1. Iris regional boundaries



22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/human-health-diagnosis-system-based-on-iris-features/196985

Related Content

An Embedded Vision System for RoboCup

P. Cavestany Olivares, D. Herrero-Pérez, J. J. Alcaraz Jiménez and H. Martínez Barberá (2013). *Robotic Vision: Technologies for Machine Learning and Vision Applications* (pp. 333-351).

www.irma-international.org/chapter/embedded-vision-system-robocup/73198

Applications of Kernel Theory to Speech Recognition

Joseph Picone, Aravind Ganapathiraju and Jon Hamaker (2007). *Kernel Methods in Bioengineering, Signal and Image Processing* (pp. 224-245).

www.irma-international.org/chapter/applications-kernel-theory-speech-recognition/24825

Combining Block DCV and Support Vector Machine for Ear Recognition

Zhao Hailong and Yi Junyan (2018). *Computer Vision: Concepts, Methodologies, Tools, and Applications* (pp. 774-783).

www.irma-international.org/chapter/combining-block-dcv-and-support-vector-machine-for-ear-recognition/196978

An Efficient Adaptive Algorithm for Electron Microscopic Image Enhancement and Feature Extraction

Vivek Arya, Vipul Sharma and Garima Arya (2019). *International Journal of Computer Vision and Image Processing* (pp. 1-16).

www.irma-international.org/article/an-efficient-adaptive-algorithm-for-electron-microscopic-image-enhancement-and-feature-extraction/224376

Significant Enhancement of Segmentation Efficiency of Retinal Images Using Texture-Based Gabor Filter Approach Followed by Optimization Algorithm

Upendra Kumar (2017). *International Journal of Computer Vision and Image Processing* (pp. 44-58).

www.irma-international.org/article/significant-enhancement-of-segmentation-efficiency-of-retinal-images-using-texture-based-gabor-filter-approach-followed-by-optimization-algorithm/177200