Abstract

This paper presents a method of personal authentication process using digital retinal image matching. The process composed of four modules: reference point’s detection, blood vessel segmentation and derivation of corresponding binary image skeleton of one pixel width, feature points extraction and finally matching similarities among these feature points of different
Personal Authentication through Retinal Blood Vessels Intersection Points Matching

images. The Fovea center and the Optic disc are used as reference points for compensating the unwanted rotational and translational effects. The maximum principal curvature of the Hessian matrix of the intensity image is used along with some image filtering to segment the blood vessel structure. Then the skeleton of the binary image and corresponding blood vessel intersection points are extracted using two proposed algorithms. Finally the matching process is done by proximity analysis of the intersection points of different retinal images. The whole process is then tested on several retinal images of different persons and the tested images were classified correctly.

Reference

Index Terms

Computer Science

Security

Key words

Biometric personal authentication

Fovea center detection

Optic disc detection

Retina blood vessel

skeleton generation

Blood vessel intersection point detection

Blood vessel segmentation