AN IMPROVED IRIS RECOGNITION SYSTEM USING ZIGZAG COLLARETTE AREA AND SUPPORT VECTOR MACHINES

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We propose an improved iris recognition method for person identification using an iris segmentation approach based on chain code theorem and zigzag collarette area with support vector machine (SVM). Iris region is roughly localized using the prior-knowledge of the iris and this removes the irrelevant regions for subsequent processing, which in turn results lower computational cost. To find the pupil a linear threshold is applied first in the iris image. Next, chain code algorithm is deployed for papillary localization. From this localized region, the central moments are estimated and the edges of the pupil are obtained with the creation of two imaginary orthogonal lines passing through the centroid of the region. Zigzag collarette area is one of the most important parts of iris complex patterns, since it is usually insensitive to the pupil dilation and not effected by eyelid and eyelashes unless the iris is partly occluded since it is closed with the pupil. The zigzag collarette region is generally concentric with the pupil and the radius of this area is restricted in a certain range. So we can detect the zigzag collarette area easily through the center of the pupil. Eyelids and eyelashes are also isolated to improve the recognition accuracy. Gabor wavelet technique is applied to extract the deterministic features from the normalized iris image. In this paper, SVM is used for iris pattern classification and recognition. Kernel parameters of support vector machine are tuned to improve the overall system performance. Our results also indicate that the performance of SVM as a classifier is far better than the performance of artificial neural network, K-nearest neighbor, Hamming and Mahalanobis distance. The proposed innovative technique is computationally effective as well as reliable with 99.4% recognition accuracy.