Iris Recognition System Based on Lifting Wavelet

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Abstract

At present, the need for a precise biometric identification system that provides reliable identification and individual verification has rapidly increased. Biometric recognition system based on iris is a reliable human authentication in biometric technology. This paper proposed a new iris system using on lifting wavelet transform to recognize persons using low-quality iris images. At first, the iris area is localized. Then, it converted to the rectangular area. For discrimination purpose, a set of features are determined from the lifting wavelet subbands, where the iris area is analyzed to three levels. Also, the new method depends on using quantizing the two subbands (LH3 and HL3) and the average values for the two high-pass filters areas (HH1, HH2) to build the iris code. CASIA V1 dataset of iris images is used to measure the performance of proposed method. The test results indicated that the new method gives good identification rates (i.e., 98.46%) and verification rates (i.e., 100%) for CASIA V1 dataset.

Keywords

Biometric Iris recognition Lifting wavelet Identification Verification

References

1. Agarwal, V., et al.: Human identification and verification based on signature, fingerprint and iris integration. In: 2017 6th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO). IEEE (2017)
Google Scholar (https://scholar.google.com/scholar?q=Agarwal%2C%20V.%2C%20et%20al.%3A%20Human%20identification%20and%20verification%20based%20on%20signature%2C%20fingerprint%20and%20iris%20integration.%20In%3A%202017%206th%20International%20Conference%20on%20Reliability%2C%20Infocom%20Technologies%20and%20Optimization%20%28Trends%20and%20Future%20Directions%29%20%28ICRITO%29.%20IEEE%20%282017%29%E2%80%8F)

2. Ukpai, C.O., Dlay, S.S., Woo, W.L.: Iris feature extraction using principally rotated complex wavelet filters (PR-CWF). In: 2015 International Conference on Computer Vision and Image Analysis Applications (ICCVIA). IEEE (2015)
Google Scholar (https://scholar.google.com/scholar?q=Ukpai%2C%20C.O.%2C%20Dlay%2C%20S.S.%2C%20Woo%2C%20W.L.%3A%20Iris%20feature%20extraction%20using%20principally%20rotated%20complex%20wavelet%20filters%20%28PR-CWF%29.%20In%3A%202015%20International%20Conference%20on%20Computer%20Vision%20and%20Image%20Analysis%20Applications%20%28ICCVIA%29.%20IEEE%20%282015%29)

3. Umer, S., Dhara, B.C.: A fast iris localization using inversion transform and restricted circular Hough transform. In: 2015 Eighth International Conference on Advances in Pattern Recognition (ICAPR). IEEE (2015)
Google Scholar (https://scholar.google.com/scholar?q=Umer%2C%20S.%2C%20Dhara%2C%20B.C.%3A%20A%20fast%20iris%20localization%20using%20inversion%20transform%20and%20restricted%20circular%20Hough%20transform.%20In%3A%202015%20Eighth%20International%20Conference%20on%20Advances%20in%20Pattern%20Recognition%20%28ICAPR%29.%20IEEE%20%282015%29)

4. Dhavale, S.V.: DWT and DCT based robust iris feature extraction and recognition algorithm for biometric personal identification. Int. J. Comput. Appl. 7 (2012)
Google Scholar (https://scholar.google.com/scholar?q=Dhavale%2C%20S.V.%3A%20DWT%20and%20DCT%20based%20robust%20iris%20feature%20extraction%20and%20recognition%20algorithm%20for%20biometric%20personal%20identification.%20Int.%20J.%20Comput.%20Appl.%207%20%282012%29)

5. Elhoseny, M., et al.: Cascade multimodal biometric system using fingerprint and Iris patterns. In: International Conference on Advanced Intelligent Systems and Informatics. Springer, Cham (2017)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Cascade%20Multimodal%20Biometric%20System%20Using%20Fingerprint%20and%20Iris%20Patterns&author=Mohamed.%20Elhoseny&author=Ehab.%2

0Essa&author=Ahmed.%20Elkhateb&author=Aboul%20Ella.%20Hassanien&author=Ahmed.%20Hamad&pages=590-599&publication_year=2017)

6. Radu, P., et al.: Optimizing 2D gabor filters for iris recognition. In: 2013 Fourth International Conference on Emerging Security Technologies (EST). IEEE (2013). Google Scholar (https://scholar.google.com/scholar?q=Radu%2C%20P.%2C%20et%20al.%3A%20Optimizing%202D%20gabor%20filters%20for%20iris%20recognition.%20In%3A%202013%20Fourth%20International%20Conference%20on%20Emerging%20Security%20Technologies%20%28EST%29.%20IEEE%20%282013%29.%E2%80%8F)

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