Robust partitioning and indexing for irisbiometric database based on local features

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ABSTRACT

Explosive growth in the volume of stored biometric data has resulted in classification and indexing becomingimportant operations in image database systems. Consequently, researchers are focused on finding suitable features of imagesthat can be used as indexes. Stored templates have to be classified and indexed based on these extracted features in a mannerthat enables access to and retrieval of those data by efficient search processes. This paper proposes a method that extracts themost relevant features of iris images to facilitate minimisation of the indexing time and the search area of the biometricdatabase. The proposed method combines three transformation methods DCT, DWT and SVD to analyse iris images andextract their local features. Further, the scalable K-means++ algorithm is used for partitioning and classification processes, andan efficient parallel technique that divides the features groups causing the formation of two b-trees based on index keys isapplied for search and retrieval. Moreover, search within a group is achieved using a proposed half search algorithm.Experimental results on three different publicly iris databases indicate that the proposed method results in a significantperformance improvement in terms of bin miss rate and penetration rate compared with conventional methods.