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Face Recognition System Based on Fusion Features of Local Methods Using CCA

Absract

Information fusion is a solution espoused for enhancing a pattern recognition system's performance. A single representation précises the information and presents a single cue on the data; thus, information fusion is said to be more prolific as every feature set depicts a different outlook on the actual dataset. This paper recommends a face recognition system by utilizing fusion features of two local descriptor approaches. Firstly, blending of two most effective local face features, namely Gabor transform features and Local Binary Pattern (LBP), renders significantly improved performance compared to either individually: they complement each other wherein small appearance details are captured by LBP, while Gabor includes encoding facial shape for a wider range of scales. Secondly, to the combined feature vector, applying of the Canonical Correlation Analysis method (CCA) is done in order to extract discriminant characteristics for recognition. Lastly, a support vector machine (SVM) is deployed for classification, and K-nearest neighbor (K-NN) is utilized for feature matching. The technique is assessed against many challenging face datasets such as Yale database, with encouraging outcomes.

Keywords

Discriminant correlation analysis; Face recognition; Gabor wavelets transform; K-nearest neighbors; Local binary pattern; Support vector machine