Abstract

Face recognition has been a fast growing, challenging and fascinating area in real time applications. A large number of face recognition algorithms have been developed in last decades. This paper presents a face recognition approach that utilizes the Sobel operator, Local Ternary Pattern (LTP) descriptor, Gabor features and Principal Component Analysis (PCA) algorithms to attain enhanced recognition accuracy where training set has only one image per person. In particular, the edge information of face image is enhanced using Sobel operator. Then we use LTP on the image to encode the micro-level information of spots, edges and other local characteristics. Finally Gabor-wavelets based features are then extracted and their histograms are concatenated together into a contiguous histogram to be used as a descriptor of the face. As Gabor features cause a very high dimensional histogram vector, therefore PCA is used to reduce the dimension. This approach is compared with the original LBP, LTP and Sobel LTP on gray-level images for face recognition. The experimental results exhibit that our method provides a remarkable performance under various conditions.
Single Image Face Recognition based on Gabor, Sobel and Local Ternary Pattern

References


Index Terms
Keywords

Face recognition, Local Binary Pattern (LBP), Local Ternary Pattern (LTP), Sobel operator; Sobel LTP (S_LTP), Gabor features, Gabor Sobel LTP (G_S_LTP), Principal Component Analysis.