FACE RECOGNITION BASED ON PCA, R-LDA AND SUPERVISED NEURAL NETWORKS

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Abstract

The paper presents a novel approach of analysis & application of Principal Component Analysis (PCA), Regularized-Linear Discriminant Analysis (R-LDA) and supervised neural networks in Face Recognition. PCA and R-LDA extract low dimensional feature vectors of human face images to drive neural networks effectively. In image preprocessing procedure colored images are converted to gray scale. After applying histogram equalization, each image is presented to PCA or R-LDA for normalization and dimension reduction. The preprocessing steps of PCA or R-LDA produce Low dimensional feature vectors appropriate for training. Artificial neural network (ANN) are massively distributed parallel processing system made up of highly interconnected processing elements that have ability to learn and acquire knowledge. We have used Back Propagation & Radial Basis Function as classifiers. The feature vectors of training samples are provided as input to these supervised neural networks. Both neural networks classified the most of the testing samples accurately.

The analysis of obtained results has shown that R-LDA preprocessed feature vectors driven by supervised neural networks are having better recognition performance than PCA. While among supervised neural networks RBF gave most matched output during testing.

Keywords: Face Recognition, Principal Component Analysis (PCA), Regularized-Linear Discriminant Analysis(R-LDA), Radial Basis Function (RBF), Back Propagation (BP), Multi Layer Neural Network, Small Sample Size (SSS).