عنوان مقاله:

Fast Automatic Face Recognition from Single Image per PersonUsing GAW-KNN

محل انتشار:

فصلنامه سیستم های اطلاعاتی و مخابرات, دوره 2, شماره 7 (سال: 1393)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Hasan Farsi - *Department of Electrical and Computer Engineering, University of Birjand, Birjand, Iran*

Mohammad Hasheminejad - *Department of Electrical and Computer Engineering, University of Birjand, Birjand, Iran*

خلاصه مقاله:

Real time face recognition systems have several limitations such as collecting features. One training sample per targetmeans less feature extraction techniques are available to use. To obtain an acceptable accuracy, most of face recognitionalgorithms need more than one training sample per target. In these applications, accuracy of recognition dramaticallyreduces for the case of one training sample per target face image because of head rotation and variation in illuminationstate. In this paper, a new hybrid face recognition method by using single image per person is proposed, which is robustagainst illumination variations. To achieve robustness against head variations, a rotation detection and compensation stageis added. This method is called Weighted Graphs and PCA (WGPCA). It uses harmony of face components to extract andnormalize features, and genetic algorithm with a training set is used to learn the most useful features and real-valuedweights associated to individual attributes in the features. The k-nearest neighbor algorithm is applied to classify newfaces based on their weighted features from the templates of the training set. Each template contains the correcteddistances (Graphs) of different points on the face components and the results of Principal Component Analysis (PCA)applied to the output of face detection rectangle. The proposed hybrid algorithm is trained using MATLAB software todetermine best features and their associated weights and is then implemented by using delphi XE2 programmingenvironment to recognize faces in real time. The main advantage of this algorithm is the capability of recognizing the faceby only one picture in real time. The obtained results of the proposed technique on FERET database show that theaccuracy and effectiveness of the proposed algorithm.

کلمات کلیدی:

EBGM; Face Recognition; PCA; Weighted Feature; WGPCA