Probabilistic Neural Network with GLCM and Statistical Measurements for Increasing Accuracy of Iris Recognition System

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Abstract

The main advantage of biometric system in security mode is either in verification process or identification process for the persons. Iris recognition is one of the fast, accurate, reliable and secure biometric techniques for human identification. It provides automatic authentication of an individual based on the characteristics and unique features in iris structure. Thus the most important step in biometric system is the method of extract feature from pattern, especially in using Artificial Neural Networks (ANN) in the matching (recognition) process. There will be a close relationship between the type of network used and the method of extracting features. In this paper, three method of features extraction is tested using three types of GLCM based on number of angles for each type (2-Ang, 3-Ang, 4-Ang) as First Order Statistics (FOS) and 10 statistical measures as Second Order Statistics (SOS) for each type with three models of PNN, so as the model created is dependent on number of classes (20, 25, 30) in each model. Experimental results proved that third method (4ang-GLCM) of feature extraction with higher trained classes (30) had given best Recognition Rate with accuracy 94.43%. Thus, experimental results have been indicated to the efficiency of the proposed system in recognition
accuracy in comparison with the previous methods.

References


Index Terms

Computer Science  Image Processing

Keywords

Iris recognition system (IRS), Histogram Equalization (HE), Region of interest (ROI), Artificial Neural Network (ANN), Probabilistic Neural Network (PNN), Gray Level Co-occurrence Matrix (GLCM), First Order Statistics (FOS), Second Order Statistics (SOS).