Abstract

In this paper, research carried out to test the wavelet and co-occurrence matrix based features for rotation invariant texture image retrieval using fuzzy logic classifier. Energy and Standard Deviation features of DWT coefficients up to fifth level of decomposition and eight features are extracted from co-occurrence matrix of whole image and each sub-band of first level DWT decomposition. The texture image is rotated in six different angles. Each rotated texture image
sampled to the 128x128, and 256x256 size. The suitability of features are tested using a fuzzy logic classifier. The performance is measured in terms of Success Rate. Success rate is calculated for each rotated texture samples and each of the feature sets. The minimum number of features required for maximum average success rate is obtained. The research shows that for samples of 256x256 size, excellent success rate is achieved for all rotation angle with Wavelet Statistical Features (WSF) as well as Wavelet Co-occurrence Features (WCF). Also energy features perform better than standard deviation features for every rotation angle considered. Also worst case analysis shows that energy features never fail to classify for any of the texture image and more consistent than other features, during the experiment. 8 co-occurrence feature set performs better than 5 co-occurrence feature set. For both the types of features performance degrades in case of 128x128 sample size.

Reference

Wavelet and Co-occurrence Matrix based Rotation Invariant Features for Texture Image Retrieval using Fuzzy Logic

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