Abstract

A digital image watermarking scheme must be robust against a variety of possible attacks. In the proposed approach, a new rotation and scaling invariant image watermarking scheme is proposed based on rotation invariant feature and image normalization. The rotation invariant features are extracted from the segmented areas and are selected as reference points. Sub-regions centered at the feature points are used for watermark embedding and extraction. Image normalization is applied to the sub-regions to achieve scaling invariance. In the scheme, first, the image is segmented into a number of homogeneous regions and the feature points are extracted. Then the circular regions for watermark embedding or extraction are defined. Based on the image normalization and orientation assignment, the rotation, scaling, and translation invariant regions can be used for watermark embedding and extraction. The segmented image is modeled as mixture generalized Gaussian distribution and this model is the basis of mathematical analysis of various aspects of the watermarking processes such as probability of error, embedding strength adjustment. The watermark embedding strength is
adjusted adaptively using the noise visibility function. The original image is not needed for the watermark detection. The effectiveness and accuracy of the proposed scheme is established through experimental results.

Reference


Index Terms

Computer Science

Information Security

Key words

Image normalization
watermarking
Noise

visibility function
segmentation