Abstract

For image analysis image decomposition or segmenting the images is a basic requirement. For decomposing the images probability models play a vital role. This paper addresses image decomposition using three parameter logistic type mixture distribution. Here it is assumed that the pixel intensities of image region follow a three parameter logistic type probability distribution. The estimation of parameters is carried utilizing Expectation and Maximization algorithm. The initialization of the parameters is done with K-means algorithm and moment method of estimation the number of image regions is obtained counting the peaks of the histogram drawn for the pixel intensities of the whole image. The decomposition algorithm (segmentation) is developed under maximum component likelihood function with Bayesian considerations. The efficiency of the proposed algorithm is studied by computing the metrics for segmentation such as GCE, VOI, PRI. The experimentation is conducted with five randomly chosen images taken from Berkeley image database revealed that the proposed algorithm is superior to the other model based segmentation algorithms for some images, which are having laptykurtic image regions. A comparative study with that of segmentation algorithm based on GMM is also
Regional Decomposition of Images using Three Parameter Logistic Type Mixture Model with K-Means

presented.

References


Index Terms

Computer Science          Image Processing

Keywords

Image decomposition, Three parameter logistic type mixture distribution, Expectation and Maximization algorithm, Metrics of segmentation, K-means algorithm.