Abstract

Image thresholding is a well known image segmentation procedure extensively attempted to obtain binary image from the gray level image. In this article, histogram based bi–level and multi-level segmentation is proposed for gray scale images using Bat Algorithm (BA). The optimal thresholds are attained by maximizing Otsu’s between class variance function. The performance of BA is demonstrated by considering five benchmark (512 x 512) images and compared it with the existing algorithms such as Particle Swarm Optimization (PSO), and Bacterial Foraging Optimization (BFO) existing in the literature. The performance assessment between algorithms is carried out using prevailing parameters such as objective function, Peak Signal to Noise Ratio (PSNR), and Structural Dissimilarity (SSIM) index. The results evident that BA provides better objective function, PSNR and SSIM compared to PSO, and BFO considered in this study.


Gray-Level Histogram based Multilevel Threshold Selection with Bat Algorithm


Index Terms

Computer Science

Algorithms
Keywords

Histogram  Otsu  Bat algorithm  Segmentation  PSNR  DSSIM