Abstract

Segmentation is one of the most important steps in image analysis. Image segmentation is the process of separating the foreground objects from the background. The earlier techniques use Genetic Algorithms (GAs) to separate the images containing regular, circular and elliptical-shaped objects from the background. The proposed technique uses the GA to segment the images containing irregular shaped objects. The Parallel Computing Genetic Algorithm (PCGA) implemented using Matlab PCT toolbox is also used to reduce computation time of image segmentation. The GA and PCGA are implemented using one-point, two-point and multiple-point crossover operators. The proposed GA-based approach gives us good results for noisy images containing irregular shaped objects as well as circular or elliptical and rectangular objects. The results obtained give 94% to 99% segmentation accuracy for different types of noise (Poisson, salt and pepper, Gaussian and Speckle) and high noise levels (SNR ranging between 1.75 dB to 8.75 dB). A significant speedup is obtained by using PCGA compared with the serial GA implementation.

References


**Index Terms**

Computer Science

Image Processing
Keywords
Genetic Algorithm  Image Segmentation  Parallel Computing