Segmentation of Images Containing Multiple Intensity Levels using Genetic Algorithms

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 126
Number 9

Year of Publication: 2015

Authors:
B.D. Phulpagar, R.S. Bichkar

10.5120/ijca2015906186

Abstract

Image segmentation technique is the process of separating the foreground objects of different intensities from the background. Several authors have proposed different methods for segmentation of images into two classes, each one having different quality of segmentation. Yu et al [1] used a GA approach to segmentation of 2-D images into two classes. We have extended this method to segment the images into multiple classes or multiple intensity levels (Four, Eight, Twelve and Sixteen grey Levels). The proposed GA-based approach gives us good results for original synthetic images and noisy images containing rectangular, elliptical and irregular-objects using morphological operations upto sixteen classes. The results obtained give 81% to 100% pixel classification accuracy for different types of noise (Gaussian, Speckle, salt and pepper and Poisson) and high noise levels (SNR ranging between 2.18 dB to 6.97 dB). The segmentation results obtained by using proposed GA-based method are good as compared to standard image segmentation FCM method with the increasing noise density of salt and pepper and Gaussian noises.
References


Index Terms

Computer Science  Artificial Intelligence

Keywords
Genetic Algorithm, Multiple Intensity Levels, Image Segmentation.