

# **Radar Image Segmentation using Particle Swarm and Gravitational Search**

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*Abstract:* Image segmentation can recognize the areas of interest in a scene. Due to the presence of speckle noise, segmentation of Synthetic Aperture Radar (SAR) images is still a challenging problem. In this research paper we presented a radar image segmentation using modified particle swarm and gravitational search algorithm (PSO-GSA). In this method, threshold assessment is observed as an exploration process that examines for a suitable value in a continuous grayscale interval. Hence, proposed modified PSO-GSA algorithm is familiar to explore the optimal threshold. In order to provide an efficient fitness function with our proposed modified PSO-GSA algorithm, we assimilate the concept of grey number in Grey theory, maximum provisional entropy to get an enhanced two-dimensional grey entropy. In core, the segmentation speed of our proposed method owes to PSO-GSA algorithm, which has an owing convergence performance. Moreover, the segmentation quality of our proposed method is benefitted from the enhanced two-dimensional grey entropy, which results in mitigation of noise. Experimental results indicate that our method is superior to conventional PSO-GSA, GA based, AFS based and ABC based methods in terms of segmentation time and thresholding.

*Keywords:* Digital image processing, Image Segmentation, SAR images, PSO-GSA, Radar Images, Particle swarm and gravitational search.