SURVEY OF IMAGE SEGMENTATION AND CLASSIFICATION USING MARKOV RANDOM FIELD

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ABSTRACT

This paper presents a multiresolution image segmentation method based on the sampling method and Markov random field (MRF) modeling. A major contribution of this work is to add sampling approach to the segmentation algorithm producing the same segmentation pattern at different resolutions. The multiresolution technique is one of the most important techniques for image segmentation and proposes a new image segmentation model by incorporating the multiregion-sampling and the Markov random field model. Experiments are conducted using synthetic aperture radar data and remote sensing images, which demonstrates that our method can improve the segmentation accuracy compared with the multiresolution method based on the pixel level. The proposed method is more computationally efficient as compared to standard Markov random field (MRF) models. Furthermore, the proposed MRS-MRF algorithm estimates the number of regions in the image in an unsupervised fashion. The effectiveness of the proposed MRS-MRF algorithm is illustrated using synthetic and real data.

KEYWORDS: Image Segmentation, Sampling Method, Markov Random Field (MRF), Multiresolution Technique, Region