

Object oriented classification of GF-2 remote sensing images based on improved multi-scale segmentation

Xue Ding (1), JinLiang Wang (1), JunChengShi (1)

¹Yunnan Normal University, College of Tourism and Geographic Sciences, Kunming, 650500, China

Email: 541827715@qq.com; wang_jinliang@hotmail.com;
850945232@qq.com

Abstract: GF-2 remote sensing image can obtain specific features, such as much ground object spectral information, rich texture, shape and structure. The object-oriented classification method can obtain high classification accuracy from GF-2 remote sensing image and accurate information of surface features. Using object-oriented thinking, we need to get the most accurate segmentation object. However, there is a homologous spectrum for GF-2 remote sensing images, and there is no uniform scale when segmenting objects. Unreasonable segmentation scale will lead to under-segmentation and over-segmentation, which will result in object fragmentation and salt and pepper noise. In order to solve this problem, this paper proposes a new method of multi-scale segmentation for different object-oriented methods. Based on this, a new optimal scale calculation method is proposed, which combines the traditional RMAS index method, ESP optimal scale analysis algorithm, and utilizes the segmentation quality evaluation model to determine the optimal scale segmentation method and scale of different objects, which can include the GF-2 multi-spectral data information extremely and then optimize the spectral difference segmentation effect. Finally, with the DEM, slope, spectral features, geometric features, texture features, shape features and other characteristics, random forest algorithm is used to optimize the feature space, reduce the redundancy of feature items, and construct the cart decision tree in the corresponding object layer to classify the images, and finally integrate all the object layer categories to get the results. The research shows that the overall accuracy of the classification results is 91.21%, and the kappa coefficient is 0.89. Compared with the traditional object-oriented Bayes method, KNN method and SVM method, the accuracy of the method is improved obviously, and the effectiveness of the method is verified.

Keywords: object-oriented classification, multi-scale segmentation, optimal scale, GF-2 remote sensing image