



Identification of cultivated land using remote sensing images based on object-oriented artificial bee colony algorithm

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Cultivated land resources is the key to ensure food security. Timely and accurate access to cultivated land information is conducive to a scientific planning of food production and management policies. The GaoFen 1 (GF-1) images have high spatial resolution and abundant texture information and thus can be used to identify fragmented cultivated land. In this paper, an object-oriented artificial bee colony algorithm was proposed for extracting cultivated land from GF-1 images. Firstly, the GF-1 image was segmented by eCognition software and some samples from the segments were manually identified into 2 types (cultivated land and non-cultivated land). Secondly, the artificial bee colony (ABC) algorithm was used to search for classification rules based on the spectral and texture information extracted from the image objects. Finally, the extracted classification rules were used to identify the cultivated land area on the image. The experiment was carried out in Hongze area, Jiangsu Province using wide field-of-view sensor on the GF-1 satellite image. The total precision of classification result was 94.95%, and the precision of cultivated land was 92.85%. The results show that the object-oriented ABC algorithm can overcome the defect of insufficient spectral information in GF-1 images and obtain high precision in cultivated identification.