STUDY AND APPLICATION OF A MULTI-RESOLUTION HIERARCHY REMOTE SENSING IMAGE CLASSIFICATION

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Remote sensing devices have collected a considerable amount of data about the nature of the Earth's surface. How to extract high precise information from remotely sensed data, however, is one of the key issues on research and application of remote sensing. Remote sensing image classification and analysis have become the context in which special information extraction, dynamic change forecast, thematic mapping and building remote sensing dataset will be implemented. Based on the principle of remote sensing image classification, the paper roundly discusses all kinds of conservative methods of supervised classification and unsupervised classification of remote sensing image, and simply appraises their advantage and disadvantage, and suitable occasions. The newest methods of computerized remote sensing image classification are discussed with the attempt to bring out the trend of remote sensing image classification. In the end, this paper proposes a new classification method based on the multi-resolution hierarchy in order to have new breakthrough for the research of the classification method of remote sensing image.

Multi-resolution hierarchy classification is a promising approach for integration of remote sensing and GIS at semantic level. This method has been performed following steps as: The first is to build a multi-resolution hierarchy dataset of remote sensing considering natural inherent relation between pixels and multi-resolution hierarchy structure of the spatial entities because there is best appropriate spatial resolution in relation to the given spatial object in theory. The second is to employ respectively artificial neural network method and decision tree approach to determine relationships of different classes from homo-hierarchy and relationships of same classes from multi-hierarchy remotely sensed data so as to circumvent these problems by focusing on fewer classes to be identified. The third is practice decision tree approach to build the relations between a certain kinds of spatial objects from different hierarchy in order to extract semantic information. Extracted semantic information benefits the better classification of remote sensing image in return. Consequently, this method can be used for integration of remote sensing and GIS at semantic level. This method proposed in this paper has been performed in ArcView platform for eco-environment investigation in Yunnan province. The results show that multi-resolution hierarchy classification is a promising approach for integration of remote sensing and GIS at semantic level.