

TEXTURE ANALYSIS TO IMPROVE SUPERVISED CLASSIFICATION IN IKONOS IMAGERY

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ABSTRACT:

The most extensive use of Remote Sensing data is in land cover/land use (LCLU) studies by means of automated image classification. The general objective of this research is to develop an automatic pixel-based classification methodology with the aim to produce a Regional land use map congruent with the CORINE Land Cover legend. Starting point are detailed ground data, already gathered fostering interoperability among several Regional bodies' DBs and high resolution multi-spectral IKONOS imagery. In the light of land mapping, there are two main features related to IKONOS imagery: lack of spectral information (4 spectral bands) and high spectral variability (high spatial resolution). This results in problems in terms of class information extraction especially using pixel-based image classification methods in which spatial information existing between a pixel and its neighbours is not used. To overcome these deficits, the use of vegetation indexes (NDVI feature and TDVI masks) and texture (GLCM and edge-density features) is investigated with respect to its impact on land cover/land use classification. The developed spectral/textural classification schema is compared with the classical approach using only spectral information. An accuracy assessment is carried out which shows that image data with 4 IKONOS spectral bands plus NDVI band plus 6 texture bands achieve an accuracy of 80.01% compared to 63.44% of accuracy achieved by using the few spectral bands only. Furthermore it allows the discrimination of 10 CLC classes. Experimental results show how, starting from available but also binding data (IKONOS imagery and available Regional ground data), a classification schema can be developed with enhanced performance and strong relation to the specific setup.

TOPIC: Land cover classification

ALTERNATIVE TOPIC: Land cover classification