COMPARATIVE STUDY OF ENTROPY MEASURES FOR ACCURACY ASSESSMENT OF SUP-PIXEL CLASSIFICATION OF SATELLITE DATA

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Technical Commission VII Symposium 2010

KEY WORDS: Land Cover, Classification, Fuzzy Logic, IRS, Accuracy, Multispectral

ABSTRACT:

Entropy is commonly used to measure the disorganization in a physical system. But in remote sensing, different authors have defined a number of entropy measures to check the accuracy of sub-pixel classification with respect to a sub-pixel reference data. Further, entropy has also been used as an accuracy index. But, the fact whether entropy can be used effectively to find the accuracy of classification is still to be established. This paper discusses whether entropy provides an appropriate accuracy measure and what else information can be obtained from the values of entropy obtained by using various formulae. For different class based and pixel based classification entropy have been derived, in this study and have been evaluated as an index towards sub-pixel classification. It has been found that measures based on exponential fuzzy entropy, entropy defined by Foody, De Luca and Termini as well as by Bart & Kosko can be used to find the mixed pixels present in a dataset. But none of these measures is a suitable as an index towards sub-pixel classification. Whereas Kaufmann pixel based entropy is suitable to separate the mixed and pure pixels from a classified image and its class based entropy measure is a useful accuracy index that represents the class membership variation in an exact manner. But since there is no accuracy index is available for this measure, only a relative result can be obtained to check the accuracy of each classification with respect to the reference class.

TOPIC: Land cover classification
ALTERNATIVE TOPIC: Multi-spectral and hyperspectral remote sensing