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Commentary

Image Analyzations of Remote Sensing Data

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DESCRIPTION

Remote sensing is defined as the measurement of object properties on the earth's surface using data acquired from aircrafts and Satellites. Remote sensing systems deployed on Satellites provide repetitive and consistent view of the earth. A particularly important application of remote sensing is the generations of land use/land cover maps from Satellite imageries and aerial photographs. Land-use mapping using Satellite imageries has the advantages of low cost, large area coverage, repetitivity and computability. Since the launch of Landsat-1, the first Earth resource Satellite, in 1972, remote sensing has become an increasingly important tool for the inventory, monitoring and management of earth resources. Remote sensing has made enormous progress over the years and a variety of sensors now deliver medium to high resolution data on an operational basis. With a rising number of sensors and increasing.

Performance of these sensors, new tasks originate which are handled more efficiently by remote sensing techniques than by standard procedures. A vast majority of applications still rely on basic image processing techniques developed in early 1970s classification of single pixel in multi-dimensional feature space. Computer classification of the multispectral data collected over a region is typically done by applying "simple symmetric" decision rule to each element (pixel). Most classification algorithms produce a "likelihood" function for the assignment of a class label to each pixel. Such discrete categorization is convenient and appealing in its simplicity, but is not an accurate portrayal of real landscapes, and in fact, is inconsistent with the high resolution images. The nature of the classifier is important, because conventional classifiers are based on a set of assumption about the data. For example, the frequently used maximum likelihood classifier assumes that each class follows a normal distribution. This assumption is vulnerable when the remote sensing data where the classes have a range of distribution. To a large extent, ability to perform an accurate classification of a given multispectral image is determined by the extent of overlap between class signatures. As the size of area to be classified increases, the classification accuracy typically decreases.

A major question, therefore, is how well do the class data signatures in the image correspond to the class physical characteristics that actually distinguish one category from another? An example of the type of semantic problem that can arise is the mapping of urban land use classes, such as "urban residential area" or "light industrial area". They typically are composed of several land cover types, each with different spectral signature. The problem of fixing the decision boundaries in the feature space is more in the very heterogeneous urban area.

CONCLUSION

Hence, for land use mapping, one must look for more complex relationships between physical measurements and the map classes of interest. Complexity refers to the large variety of pictorial representation of objects with some semantic meanings and also to the extensive amount of details in the scenes. Incorporating the ancillary information with remotely sensed data helps in this respect. Because, the supervised classification does not necessarily result in class signatures that are numerically separable in feature space, and unsupervised training does not necessarily result in classes that are meaningful to the analyst, more robust methods than those presently available are being investigated.

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