New Possibilities for Improving Within Class Separation in Land Cover Classification

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In the recent decade the spatial resolution of orbital remote-sensing systems has changed to a great extent. For this reason the ETM+ instrument onboard Landsat is considered to have modest spatial resolution. Combining the high spatial (less then 10m/pix) and high spectral resolution (more than 30 spectral channels), some new possibilities for obtaining precise information from remotely sensed data about the land cover types are presented. A serious task is to overcome the increased interclass spectral variability when using high order spectral data compared with low-resolution satellite scanner data. In our research we adopted the following approach – the spectral and spatial features are of equal importance. The single element of the data (in case of image – single pixel) represents more adequately the specific type of land cover. The classification of remotely sensed data is commonly carried out on a per-pixel basis, ignoring spatial characteristics and the arrangement of imaged objects. The fact that both texture and structure are as important as tone in traditional visual photointerpretation was considered as a key element in this research. Vegetation classification is important for the precision agriculture, where the information obtained can be used to improve crop quality, monitor the irrigation and fertilization process, and enhance weed management. Monitoring the vegetation cover provides information on, natural activity, landscape recovery, predict the consequences of training/testing and a landscapes' ability to accommodate it, and ultimately rehabilitate soil/vegetation complex. Another factor that could improve the vegetation state assessment is the textural information. This improvement is achieved by relating textural information to biophysical properties of the vegetation.In this study we propose a novel technique for classification of vegetation types combining spectral, spatial and textural data for better within class separation. The method applied is based on Bayesian decision rule with preliminary data processing for feature selection. The results show that the parameter selection is of crucial importance.