

## Abstract

In this work, we present a new strategy of active learning, based on a modular version of support vector machine (MSVM) applied to urban remote sensing images in Algeria. In general, the training set is highly imbalanced, which gives more complex models; this difficulty is solved by dividing the problem at hand into a set of sub-problems, where each sub-model could be simpler to solve. The support vector machine is introduced to solve the problem of classification based on image remote sensing data related to atmospheric conditions and illumination reflectance. The aim of the proposed method is to improve the accuracy in order to understand the correlated elements of urban structures (the site, the built, the parcels, the network, the space), to generate the final classification result. In particular, we propose a new method based on the modular support vector machine (MSVM) adopted to active learning method, using three different clustering methods (i) k-means, (ii) fuzzy c-means (FCM), and (iii) Gustafson–Kessel (GKclust). Experimental results obtained on two QuickBird multispectral images of Sétif and Batna cities in the eastern of Algeria confirm the capabilities of the proposed methods based on the ensemble of model trained with different task decomposition compared to a traditional model using active learning. This method improves each class presents a main register in urban structure tissues.