



## **An Exploration of Hyperion Hyperspectral Imagery Combined with Different Supervised Classification Approaches Towards Obtaining More Accurate Land Use/Cover Cartography**

Nune Igityan

United Kingdom (nune.igityan13@imperial.ac.uk)

Land use and land cover (LULC) constitutes a key variable of the Earth's system that has in general shown a close correlation with human activities and the physical environment. Describing the pattern and the spatial distribution of LULC is traditionally based on remote sensing data analysis and, evidently, one of the most commonly techniques applied has been image classification.

The main objective of the present study has been to evaluate the combined use of Hyperion hyperspectral imagery with a range of supervised classification algorithms widely available today for discriminating LULC classes in a typical Mediterranean setting. Accuracy assessment of the derived thematic maps was based on the analysis of the classification confusion matrix statistics computed for each classification map, using for consistency the same set of validation points. Those were selected on the basis of photo-interpretation of high resolution aerial imagery and of panchromatic imagery available for the studied region at the time of the Hyperion overpass.

Results indicated close classification accuracy between the different classifiers with the SVMs outperforming the other classification approaches. The higher classification accuracy by SVMs was attributed principally to the ability of this classifier to identify an optimal separating hyperplane for classes' separation which allows a low generalisation error, thus producing the best possible classes' separation. Although all classifiers produced close results, SVMs generally appeared most useful in describing the spatial distribution and the cover density of each land cover category.

All in all, this study demonstrated that, provided that a Hyperion hyperspectral imagery can be made available at regular time intervals over a given region, when combined with SVMs classifiers, can potentially enable a wider approach in land use/cover mapping. This can be of particular importance, especially for regions like in the Mediterranean basin, since it can be related to mapping and monitoring of land degradation and desertification phenomena which are evident in such areas.

**KEYWORDS:** land cover/use mapping, Hyperion, classification, Mediterranean