

Using Non-Negative Matrix Factorization Based on Satellite Imagery for the Collection of Agricultural Statistics

Authors : Benyelles Zakaria, Yousfi Djaafar, Karoui Moussa Sofiane

Abstract : Agriculture is fundamental and remains an important objective in the Algerian economy, based on traditional techniques and structures, it generally has a purpose of consumption. Collection of agricultural statistics in Algeria is done using traditional methods, which consists of investigating the use of land through survey and field survey. These statistics suffer from problems such as poor data quality, the long delay between collection of their last final availability and high cost compared to their limited use. The objective of this work is to develop a processing chain for a reliable inventory of agricultural land by trying to develop and implement a new method of extracting information. Indeed, this methodology allowed us to combine data from remote sensing and field data to collect statistics on areas of different land. The contribution of remote sensing in the improvement of agricultural statistics, in terms of area, has been studied in the wilaya of Sidi Bel Abbes. It is in this context that we applied a method for extracting information from satellite images. This method is called the non-negative matrix factorization, which does not consider the pixel as a single entity, but will look for components the pixel itself. The results obtained by the application of the MNF were compared with field data and the results obtained by the method of maximum likelihood. We have seen a rapprochement between the most important results of the FMN and those of field data. We believe that this method of extracting information from satellite data leads to interesting results of different types of land uses.

Keywords : blind source separation, hyper-spectral image, non-negative matrix factorization, remote sensing

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