

## **Filtering and Clustering Methods For Satellite Image Time Series**

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Using time series derived from big Earth Observation data sets is one of the leading research trends in Land Use Science and Remote Sensing. One of the more promising uses of satellite time series is its application for classification of land use and land cover, since our growing demand for natural resources has caused major environmental impacts. Given this motivation, this work provides a survey of two topics which are relevant for image classification: noise removal and cluster analysis. In noise removal, we investigate different techniques for filtering and smoothing time series. For cluster analysis, we discuss methods that have been published in the literature for time series clustering and test their application to SITS. This discussion is illustrated by a number of examples. In the filtering part, we did two experiments of using smoothing methods to support the classification of noisy time series. The smoothing methods applied to the data and a cross-validation showed that our improvement were insignificant when compared to the original data experiment. In the clustering part, we present some preliminary results of using agglomerative hierarchical clustering with ward linkage as merging criterion. The result of the experiments suggest that the patterns extraction by clustering process is a promising technique to improve prototype extraction from SITS data.

Satellite Image Time Series. Filtering. Clustering.