Urban Mapping using Satellite Time Series

Corina Vaduva¹, Anamaria Radoi³, Alexandru Grivei¹, Gottfried Schwarz², and Mihai Datcu¹
¹University Politehnica of Bucharest, CEOSpaceTech, Romania
²DLR German Aerospace Center, Münchener Str. 20, D-82234 Weßling, Germany

Abstract

When we analyze the development of urban areas, it becomes clear that satellite image time series are highly valuable data sources that can be exploited to describe - besides vegetation cycles and land use changes - the dynamics of urban settlements and their infrastructure.

Modern high resolution optical and SAR sensors with good signal-to-noise characteristics open new perspectives for local image classification and quantitative change analysis, while low resolution sensor data are often available over many years and provide more insight into long-term processes. Advanced analysis algorithms allow the identification of typical pixel changes and their confidence levels. Finally, data fusion represents a new perspective for urban mapping.

Test Data Set

- Multitemporal satellite image time series: Analysis of urban development in and around Bucharest, Romania using Landsat data
- Data analytics for rapid mapping: Effects of the 2011 tsunami in Japan using very high resolution TerraSAR-X data
- Automatic change analysis in satellite images: Binary descriptors and Lloyd-Max quantization
- An Earth Observation spatio-temporal data mining system

References