IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue Title:

Advanced Pattern Recognition Techniques for Remote Sensing

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Overview of Pattern Recognition Techniques in Remote Sensing:

In the last years a large number of new satellite remote sensing missions have been launched, resulting in a dramatic improvement in the capabilities of acquiring images of the Earth surface. This involves an enhanced possibility to acquire images of large areas of the Earth surface, with improved spectral and spatial resolution with respect to traditional satellite data. Nonetheless, the properties of the images acquired by the last generation sensors (e.g. very high geometrical and/or spectral resolution) pose new methodological problems that require the development of a new generation of methods for image analysis and pattern recognition. This is common to both passive (multispectral, hyperspectral, etc.) and active (synthetic aperture radar, lidar, etc.) sensors.

Due to profound in-field signature variations in remote sensing, pattern recognition techniques have been widely used for remote sensing image and data analysis. However, in the above-mentioned scenario, with sensor technology being advanced very quickly, pattern recognition techniques have been modified and improved to address the new methodological challenges defined by the new data available. For instance, the high spectral dimensionality of hyperspectral imagery imposes the constraint of limited training samples when conducting classification; the emerging very high spatial resolution of optical and synthetic aperture radar imagery requires to efficiently extract features that can describe the object present in the images. In this context, many interesting approaches, such as semi-supervised learning, active learning, and nonlinear feature extraction/selection, have been developed recently. This special issue will be helpful to update the recent progress in this rapidly evolving research area.

Special Issue Topics:

The objective of this special issue is to select outstanding contributions on recent advances in the use of pattern recognition techniques in solving remote sensing problems. This issue will be focused on the analysis of data collected from satellites or airborne sensors (Optical, SAR, LiDAR) used for Earth observations.

The topics planned to be addressed in the special issue include, but not limited to, the following areas:

- Feature extraction
- Feature selection and reduction
- Supervised classification
- Clustering
- Semi-supervised classification
- Active learning
- Target detection
- Anomaly detection

- Spectral unmixing
- Nonlinear methods
- Data mining
- Content based image retrieval
- Statistical pattern recognition
- Machine learning methods for patter recognition
- Novel remote sensing applications of pattern recognition

Source of Papers:

This special issue is associated with the 7th IAPR (International Association for Pattern Recognition) Workshop on Pattern Recognition in Remote Sensing (PRRS 2012) that will take place in November 2012 in Tsukuba Science City, Japan, as part of the International Conference on Pattern Recognition (ICPR 2012). PRRS 2012 is sponsored by IAPR and the IEEE Geoscience and Remote Sensing Society. PRRS workshop series have been organized by the IAPR Technical Committee 7 (Remote Sensing and Mapping).

The special issue will consider invited papers presented at the workshop, and contributed papers in response to an open call for papers. Contributions are expected from the research community developing new pattern recognition techniques for the analysis of remote sensing data, as well as from the application community using the results obtained from the automatic analysis.

Global Reach:

Estimated # Papers: 20

Special Issue Publication: December 2014

Proposed Timeline:

Deadline for Submission of Papers:	September 30, 2013
Review Results and Notification:	January 31, 2014
Submission of Revised Papers:	April 30, 2014
Final Acceptance of Papers:	June 30, 2014
Publication of the Special Issue:	December 2014

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