

Call for papers
IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
Special Issue on Machine Learning for Remote Sensing Data Processing

Submission Deadline: June 30, 2013

Aims and scope

Machine learning is becoming a standard paradigm for the analysis of data in many domains, including the processing of remote sensing images. In the remote sensing processing chain, machine learning tools are mainly used for filtering, interpretation and prediction. Filtering aims at removing noise and performing transformations, which may be meaningful by themselves or useful for ensuing processes. Interpretation is performed by classifiers trained on the data. (Semi-) supervised classification aims at recognition of specific patterns / objects in the data, while unsupervised classification (clustering) aims at object discovery in an exploratory way. Prediction is performed by either classifier or regression systems to estimate precise values of underlying parameters or future events in the data. In fact, the ML data processing pipeline can be characterized by a sequence of (optional) filtering, dimension reduction, classification/regression steps wrapped in a sample based validation methodology.

Well grounded methodological and validation strategies are becoming a gold standard in the community, since they allow to avoid the so-called double-dipping effects (for instance, when same data are used for training and validation of models or when validation samples are drawn from the same locations as the training samples). In this special issue, special emphasis will be placed in assisting the authors to improve the methodological standard of their reported results. A desired effect of this special issue on the remote sensing community will be a heightened awareness and acceptance of such methodological standards, and sound discussion of the way standards must be applied to the data at hand, i.e., relevance of double-dipping arguments in case they cannot be avoided.

Papers for this special issue must address applications of machine learning tools to any kind of remote sensing data (optical, hyperspectral, SAR, LIDAR, etc.) following a methodologically sound validation procedure. Results on real-life data must be included in the validation studies.

A non-exhaustive list of topics solicited is as follows:

- Algorithms founded on statistical learning theory, e.g., SVM, RVM, ...
- Ensembles of classifiers
- Bio-inspired machine learning algorithms, e.g., Artificial Neural Networks, Evolutionary Algorithms
- Hybrid approaches, e.g., Lattice Computing, Multivariate Mathematical Morphology
- Bayesian approaches
- Multiple instance models
- Nonlinear clustering, e.g. Dirichlet processes
- Relevance feedback learning and active learning
- Linear and non-linear dimension reduction or data decomposition, i.e., unmixing
- Data assimilation into models
- Data compression
- Time series processing, domain adaptation and transfer learning
- Hyperspectral image processing
- Fusion of remote sensing data and other information
- Applications, e.g., thematic mapping, resource mapping, elevation mapping, target detection, fire detection, change detection, content based image retrieval, biomass estimation and prediction of seasonal variation.

Submission

All submissions will be peer reviewed according to the IEEE and Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Manuscripts should be submitted online at <http://mc.manuscriptcentral.com/jstars> using the Manuscript Central interface. Prospective authors should consult this site for guidelines and information on paper submission. Please select « Machine Learning in Remote Sensing » as manuscript type. Informations about the Journal can be found at <http://www.grss-ieee.org/Publications/JSTARS/>. Please note that IEEE JSTARS applies a mandatory excessive page length charge of \$200 per page (beginning with page 7 and beyond).

Important dates

Manuscripts due : June 30, 2013

Expected publication date : March, 2014

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