CALL FOR PAPERS
IEEE Transactions on Computational Imaging Special Issue
Computational Imaging for Earth Sciences

From the core of the earth to the farthest reaches of our planets magnetic fields, the earth sciences are concerned with all aspects of monitoring, exploration, explanation, and exploitation of natural events and resources in the geo-sphere. Revolutions in computational imaging over the past two decades have had profound implications across this field, bringing new modalities into common use and impacting application domains from weather monitoring and prediction, subsurface sensing, seismic imaging and exploration, to the production of minerals, oil and gas. In all these areas, reliable information extraction by collecting and processing sensor data increasingly hinges on integrated sensor design, system modeling, and efficient computational methods. The scope of such models and methods have more recently integrated statistical pattern recognition and machine learning systems to account for variability that cannot be completely captured by physical models or simulation. Enabling most all of these processing methods are concomitant developments in optimization theory both in Euclidean spaces as well as on more general manifolds.

This special issue seeks to compile relevant contributions from researchers in signal and image processing, inverse problems, machine learning, and related areas *as applied to problems of image formation and analysis* arising in the context of earth science applications covering the wide range of application domains. Within the broad context of computational imaging for earth sciences, topics of interest include but are not limited to the following.

- Computational image formation and tomographic processing
- Full Waveform Inversion (FWI)
- Inverse scattering methods
- Computational hyperspectral imaging
- Advanced machine learning methods for computational imaging
- Dimensionality reduction
- Joint inversion / sensor fusion
- Probabilistic modeling including random field and graphical models
- Multilinear/tensor methods
- Sparse representations and compressive sensing
- Computational imaging methods for change and target detection

Timeline

Manuscript submission due	June 30, 2016
First review completed	August 7, 2016
Revised manuscript due	Sept 30, 2016
Second review completed	November 1, 2016
Notification of acceptance	November 15, 2016
Final manuscript due	December 15, 2016
Tentative publication date	January 15, 2017

List of Editors

1. Shuchin Aeron (**Lead Editor**), Department of Electrical and Computer Engineering, Tufts University
2. Eric L. Miller, Department of Electrical and Computer Engineering, Tufts University
3. Melba Crawford, Civil and Electrical and Computer Engineering/Chair of Excellence in Earth Observation, Purdue University
4. Alison Malcom, Department of Earth Sciences, Memorial University, Newfoundland and Labrador, Canada.
5. Andreas Reigber, German Aerospace Center (DLR), Microwaves and Radar Institute, SAR Technology Department.
6. Jocelyn Chanussot, Engineering School on Energy, Water and Environment (ENSE3), Grenoble Institute of Technology (Grenoble INP).