

IEEE Signal Processing Magazine

Call for Papers

Computational MRI: Compressed Sensing and Beyond

Magnetic resonance imaging (MRI), which is a quite powerful and versatile medical imaging modality, has witnessed a decade of extensive developments in advanced computational algorithms for image recovery. For example, advances in multichannel (parallel) MRI and compressed sensing (CS), which enabled MRI to go beyond classical Nyquist sampling limit, have facilitated considerable reduction in acquisition time in static imaging applications and improved temporal resolution in dynamic applications. The recent approval of CS products for clinical scans by the United States food and drug administration (FDA) makes MRI one of the main benefactors of CS algorithms. The excitement generated by compressive sensing and parallel MRI has initiated a computational way of thinking in MRI, resulting in several novel advances including estimation of biophysical parameters directly from measurements, non-linear measurement schemes, learned signal representations, and learned inverse operators. Many of these developments have been fueled by signal processing advances in areas including sampling, sparse and low-rank methods, and convex optimization. At the same time, the practical problems and clever computational solutions that were developed in the MRI context will find more broader appeal in the signal processing and computational imaging community.

This special issue invites well thought-out tutorial style surveys and overviews of recent, which pushes the frontier of computational MRI beyond compressed sensing. The special issue is intended as a forum with high visibility and synergy between the theoretical and the applied research in medical imaging is expected to bring together scientists from signal processing community, MRI physicists, clinicians, and industry to solve practical problems of high significance. The scope of this special issue includes, but is not limited to:

Novel image representations in MRI	Low-rank and dictionary learning in MRI
Fast optimization algorithms for MRI	Computational methods for artifact reduction
Machine learning & dimensionality reduction	Trajectory design and optimization in MRI
MR fingerprinting and applications	Learning based algorithms for MRI
Clinical translation of computational tools	Industry perspective on computational MRI

White papers are required, and full articles are invited based on the review of white papers. Articles submitted must be of tutorial and overview/survey nature and in accessible style to a broad audience. Submissions will be reviewed according to the IEEE Signal Processing Magazine guidelines and should not have been published or under review elsewhere. Submissions should be made online at <http://mc.manuscriptcentral.com/sps-ieee>. For guidelines and information on paper submissions, visit <http://signalprocessingsociety.org/publications-resources/ieee-signal-processing-magazine>

Important Dates: Expected publication date for the special issue is January 2020.

White paper due	1 December 2018
Notification of white paper review	1st January 2019
Submission of invited full-articles	1 st March 2018

Guest Editors

Mathews Jacob, University of Iowa, USA, Mathews-Jacob@uiowa.edu
Jong Chul Ye, Korea Institute of Advanced Science and Technology, jong.ye@kaist.ac.kr
Leslie Ying, State University of New York, Buffalo, USA, leiying@buffalo.edu
Mariya Doneva, Philips Research, Hamburg, Germany mariya.doneva@philips.com