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Accelerated MRI Based on Compressed Sensing and Deep Learning

Guest Editor:

Dr. Hyungseok Jang
Department of Radiology, University of California San Diego, 9500 Gilman Dr, La Jolla, CA 92093, USA

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Message from the Guest Editor

Magnetic resonance imaging is one of the most important medical imaging modalities used in clinic due to its excellent soft tissue contrast. To form an MR image, a radiofrequency signal from spins of targeted nuclei is acquired to form a 2D or 3D k-space. To achieve the desired tissue contrasts or quantitative parameters using MRI, a long signal preparation or acquisition time is required, thus a clinical MR exam that includes multiple imaging series with different image contrasts typically takes ~30 min to ~1 hours. Therefore, accelerated MR acquisition is crucial to minimizing both patient motion and discomfort.

Compressed sensing was first investigated in the field of conventional signal processing and allows the detection of signals from undersampled data by exploiting a property known as “sparsity.” It has recently been incorporated into MRI by utilizing sparsity in either the native image domain or transformed image domain. Deep learning-based accerlation techniques have been investigated in MRI.

In this Special Issue, novel accelerated MRI techniques based on compressed sensing and deep learning are presented.

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Editor-in-Chief

Prof. Dr. Vittorio M. N. Passaro
Dipartimento di Ingegneria Elettrica e dell'Informazione (Department of Electrical and Information Engineering), Politecnico di Bari, Via Edoardo Orabona n. 4, 70125 Bari, Italy

Message from the Editor-in-Chief

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Sensors Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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