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**Decoupled algorithm for MRI reconstruction using nonlocal block matching model: BM3D-MRI.** (English) Zbl 1386.68204

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Summary: The block matching 3D (BM3D) is an efficient image model, which has found few applications other than its niche area of denoising. We will develop a magnetic resonance imaging (MRI) reconstruction algorithm, which uses decoupled iterations alternating over a denoising step realized by the BM3D algorithm and a reconstruction step through an optimization formulation. The decoupling of the two steps allows the adoption of a strategy with a varying regularization parameter, which contributes to the reconstruction performance. This new iterative algorithm efficiently harnesses the power of the nonlocal, image-dependent BM3D model. The MRI reconstruction performance of the proposed algorithm is superior to state-of-the-art algorithms from the literature. A convergence analysis of the algorithm is also presented.

**MSC:**

[68U10](#) Computing methodologies for image processing

[92C55](#) Biomedical imaging and signal processing

[94A08](#) Image processing (compression, reconstruction, etc.) in information and communication theory

Cited in **3** Documents

**Keywords:**

[image reconstruction](#); [magnetic resonance](#); [block matching](#); [BM3D](#); [compressed sensing](#); [sparsity](#)

**Software:**

[DLMRI-Lab](#); [RecPF](#)

**Full Text:** [DOI](#)

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