Reconstruction schemes for MR Data

Discussion session

Maria del C. Valdés Hernández
Centre for Clinical Brain Sciences, University of Edinburgh
Super-resolution in magnetic resonance imaging: A review (2012)

- Back-projection approach
- Deterministic regularised approach
- Statistical Regularisation Approach
- Projection onto Convex sets
**New developments in 2016**

Super-resolution reconstruction of diffusion parameters from diffusion-weighted images with different slice orientations

---

Super-resolution $T1$ estimation: Quantitative high resolution $T1$ mapping from a set of low resolution $T1$-weighted images with different slice orientations

---

**Magnetic Resonance in Medicine**
Volume 75, Issue 1, pages 181-195, 22 JAN 2015 DOI: 10.1002/mrm.25597

**Magnetic Resonance in Medicine**
1 JUL 2016 DOI: 10.1002/mrm.26262
Super-resolution in other imaging modalities using Artificial Neural Networks


  http://dx.doi.org/10.1080/01431160050505892
• Is super-resolution an answer to increase fidelity on reconstructed MR data?
• Can new machine learning methods (e.g. convolutional neural networks) be applied successfully to reconstructing/increase resolution of MR data?
• Can multimodality MR (e.g. spectroscopy and MRI) be combined in super-resolution schemes?
• Can dynamic optimisation schemes be applied to reconstruct MR data?
• Can, on the other hand, current MR reconstruction schemes be applied to dynamic optimisation problems?
• Can the multi-frame super-resolution scheme presented be applied to the reconstruction/ super-resolution of MR data?