RECONSTRUCTION FROM NON-UNIFORM SPECTRAL DATA

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Certain problems such as magnetic resonance imaging (MRI) demand the reconstruction of functions from Fourier spectral data. Moreover, this data may be acquired along non-uniform sample points (e.g., non-Cartesian MR scan trajectories). The acquisition of non-harmonic Fourier data poses a significant mathematical and computational challenge in computing accurate function reconstructions.

In this poster, we discuss the reconstruction of compactly supported functions from non-uniform samples of their Fourier transform. We explain the implications of the non-harmonic acquisition and the relation between reconstruction error and spectral sampling density. Reconstructions using spectral re-projection methods are discussed, which promise improved accuracy along with the added advantage of the resolution of Gibbs artifacts. Promising preliminary results from incorporating edge information in the reconstruction procedure are also provided.