

Fractional graph Laplacian for image reconstruction

Speaker: Marco Donatelli, University of Insubria

Abstract: A popular approach to regularization is to substitute the original problem with an optimization problem that minimizes the sum of two terms, an ℓ^2 term and an ℓ^q term with $0 < q < 1$. The first penalizes the distance between the measured data and the reconstructed one, the latter imposes sparsity on some features of the computed solution. In this talk, we propose to use the fractional Laplacian of a properly constructed graph in the ℓ^q term to compute extremely accurate reconstructions of the desired images. Furthermore, we propose automatic approaches to determine the involved parameters so that the proposed method is completely plug-and-play. Some numerical examples show the performances of our proposal for computer tomography and image deblurring problems.