

Regularization with Singular Energies

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Abstract

In this talk we shall discuss some issues in the regularization with singular (nondifferentiable and nonconvex) energies such as total variation or Besov norms, which became popular in imaging and inverse problems recently. We shall discuss the analysis of such schemes based on dual concepts, i.e. a study of subgradients of the regularization energies, and numerical schemes based on primal-dual discretizations. Moreover we provide various possibilities to construct improved schemes for nonlinear inverse problems using such regularization, and we discuss some future challenges related to integrating such schemes into efficient solvers for large-scale inverse problems.