

DYNAMIC AND ADAPTIVE REGULARIZATION FOR SIGNAL DECOMPOSITION AND SOURCE LOCALIZATION PROBLEMS

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ABSTRACT

Since about fifty years, inverse problems keep on to be challenging and ubiquitous in real applications. The advances of electronic measurement techniques as well as the availability of large amount of data heighten the capabilities of estimating, by indirect measurements, physical parameters which are not directly observable. In this regard, mathematical research efforts are still compelling in developing specific regularization frameworks useful for both theoretical analysis and subsequent efficient computational implementation.

Recent developments include, in both deterministic and Bayesian approaches, variational methods by Tikhonov-like functionals with non-smooth and non-convex penalty terms, as well as extensions of regularization to dynamical, i.e., evolutionary, models. Functional analysis, optimization, and numerical linear algebra tools should be dealt in a collaborative unified way, to allow for enhancements in regularized inversions.

The aim of this minisymposium is to discuss possible connections between emerging mathematical research related to inverse problem in industrial applications, such as neuroscience or non-destructive prospecting in biomedicine and geoscience, ranging from electrical source imaging to microwave tomography and remote sensing.

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