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Sparsity and Nonconvex Nonsmooth Optimization

Sparsity (or parsimonious) optimization is a framework for examining the trade-off between optimality and the number independent variables to optimize over. Much of this framework was first developed for application to a range of problems in statistics where the goal is to explain as much of a data as possible with the fewest number of explanatory variables. Within the past few years, the general methodology of sparsity optimization has found its way into a wide range of applications. In this talk we consider a general sparsity optimization framework for arbitrary extended real-valued objective functions that are continuous on their essential domains. General approximation properties for the associated sparsity optimization problem are given, and a fixed point iteration for the subdifferential inclusion identifying approximate stationarity is developed. Convergence results and numerical experiments are presented.