

# Practical Inexact Proximal Quasi-Newton Method with Global Complexity Analysis.

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## Abstract:

Recently several methods were proposed for sparse optimization which make careful use of second-order information to improve local convergence rates. These methods construct a composite quadratic approximation using Hessian information, optimize this approximation using a first-order method, such as coordinate descent and employ a line search to ensure sufficient descent.

Here we propose a general framework, which includes slightly modified versions of existing algorithms and also a new algorithm, which uses limited memory BFGS Hessian approximations, and provide a global convergence rate analysis in the spirit of proximal gradient methods, which includes analysis of method based on coordinate descent.

We also discuss an efficient and general implementation based on this framework and show some encouraging computational results on problems from machine learning domain.