INEXACT RESTORATION WITH SUBSAMPLED TRUST-REGION METHODS FOR FINITE-SUM MINIMIZATION

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Convex and nonconvex finite-sum minimization arises in many scientific computing and machine learning applications. Recently, first-order and second-order methods where objective functions, gradients and Hessians are approximated by randomly sampling components of the sum have received great attention.

We propose a new trust-region method which employs suitable approximations of the objective function, gradient and Hessian built via random subsampling techniques. The choice of the sample size is deterministic and ruled by the inexact restoration approach. We discuss local and global properties for finding approximate first- and second-order optimal points and function evaluation complexity results. Numerical experience shows that the new procedure is more efficient, in terms of cost per iteration, than the standard trust-region scheme with subsampled Hessians.