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Spectral Gradient Methods and subsampling for Finite Sums minimization

Abstract

Spectral methods are known to be a powerful tool for solving optimization problems. In this paper, we aim to exploit the advantages of these approaches in the stochastic optimization framework, in particular combined with random gradient estimators obtained by subsampling. In order to let the spectral coefficient explore the spectrum of the approximate Hessian, we keep the same sample for several iterations before we subsample again. We analyze conditions for almost sure convergence and present numerical results showing the advantages of this class of methods

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