Convergence of Perturbed Gradient-based methods for non-smooth convex optimization

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Computational challenges in high dimensional Statistics include non-smooth convex optimization problems. The Proximal-Gradient algorithm is a popular tool for solving such an optimization problem. It relies on the computation of a gradient which, in many applications, can not be computed explicitly but can be approximated by a Monte Carlo sum. For example, when computing a penalized maximum likelihood estimator in a latent variable model, with a non-smooth sparsity penalty, the gradient is an expectation under the a posteriori distribution of the latent variables: its Monte Carlo approximation relies on MCMC outputs, and is therefore a biased approximation.
This talk will present new convergence results for perturbed proximal gradient algorithms and some accelerations, with an emphazis onn the case when this perturbation is stochastic and biased. It is a joint work with Y. Atchadé (Univ. Michigan), J.F. Aujol (IMB), C. Dossal (IMB) and E. Moulines (CMAP) - see [1].

Références

[1] Y. Atchadé, G. Fort and E. Moulines, *On Perturbed Proximal Gradient Algorithms*, arXiv:1402:2365-v3, 2016.

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