



Maximal Monotone Operators, Stochastic Approximation, and Some Applications

"Walid Hachem " (CNRS, LIGM)

Axe DataSense

Abstract

The proximal gradient algorithm allows to find the minimizers of a sum $F+G$ of two proper closed convex functions, one of them being differentiable. In this work, we introduce a stochastic version of the proximal gradient algorithm. The iterations involve an iid sequence of two random functions, whose expectations coincide with F and G respectively. The aim is to provide a convergence analysis in an adaptive context where the step size of the algorithm is constant. We prove that, in Cesaro mean, the probability that the iterates are away from the sought minimizers is small when the number of iterations tends to infinity and in the limit of small step sizes.

The ergodic behavior is studied as well. Finally, the algorithm is extended to the context of random maximal monotone operators.

Work done with Pascal Bianchi and Adil Salim (Telecom ParisTech).