Properties of the stochastic approximation EM algorithm with mini-batch sampling

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Résumé

Joint work with Catherine Matias and Tabea Rebafka (LPSM, Université de Paris, CNRS) To deal with very large datasets a mini-batch version of the Monte Carlo Markov Chain Stochastic Approximation Expectation–Maximization algorithm for general latent variable models is proposed. For exponential models the algorithm is shown to be convergent under classical conditions as the number of iterations increases. Numerical experiments illustrate the performance of the mini-batch algorithm in various models. In particular, we highlight that mini-batch sampling results in an important speed-up of the convergence of the sequence of estimators generated by the algorithm. Moreover, insights on the effect of the mini-batch size on the limit distribution are presented. Finally, we illustrate how to use mini-batch sampling in practice to improve results when a constraint on the computing time is given.

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