# AE-Review for the paper "A Class of Two-Timescale Stochastic EM Algorithms for Nonconvex Latent Variable Models" by Belhal Karimi and Ping Li

This paper presents a new class of expectation maximization algorithms for estimation in latent variable models. The aim is to deal with large datasets and complex models, where the classical EM algorithm typically fails. A new class of algorithms, based on stochastic approximation dynamic and Monte Carlo approximation, is introduced, to cope with expectation calculation which is typically a problem on large-scale problems. The authors provide theoretical results for their algorithms, that is to say finite-time upper bounds on the second order moment of the gradient of the objective function, that are independent of the initialisation, and non-asymptotic. Finally they provide numerical experiments to illustrate the performances of the algorithms: simulations, a study on a pharmacokinetic model, and an example in in image analysis.

I received two insightful reviews by experts in this domain, which both express the following opinion. While the topic is interesting, and while there seems to be potential in the proposed approach, there are several things that prevents the reader to appreciate the results. First, the paper is very badly written - see both reports for details - which prevents the reader from getting a good grasp on the results. Both the theoretical and experimental parts are written with insufficient care so that it is impossible for the reader to check the validity of the proposed results. Things are not well contextualised with respect to either the literature, or by providing sufficient explanations and intuitions, so that it is difficult to understand what the improvement with respect to the existing literature is, and what the advantage of the proposed methods are. Finally, it is suspected that the paper might be somewhat incremental with respect to existing works -see reviewer 1. This is not completely clear, but since the paper is not well written, and not put into context, it is difficult to assess its quality with certainty. For all these reasons, this paper does not seem fit for publication in Bernoulli, in its current form at least.