A Stochastic gradient method to compute Wasserstein barycenters of distributions

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We present a stochastic gradient approach to compute barycenters of probability distributions, in the sense of Wassertein. The objective is to devise a fast method which can be used for instance to perform clustering for machine learning. The optimal transport [1] provides a metric to compare two distributions, the Wasserstein distance, recently used in barycenter problems [2]. Fast methods to compute these barycenters are required when handling large amounts of data. We introduce an algorithm of the stochastic gradient class, based on an entropic regularization of the barycenter problem. We prove the convergence rate and give the complexity. We also compare this algorithm to the Sinkhorn iterations for barycenters introduced in 2015 [3]. We present numerical simulations for both methods, applied to a set of distributions corresponding to several famous authors' vocabulary.

Références

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