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Statistical Inference for Model Parameters with Stochastic Gradient Descent

MONDAY, March 5, 2018 at 4:30 PM
Eckhart 133, 5734 S. University Avenue
Refreshments before the seminar at 4:00PM in Jones 111

ABSTRACT

In this talk, we investigate the problem of statistical inference of the true model parameters based on stochastic gradient descent (SGD). To this end, we propose a consistent estimator of the asymptotic covariance of the average iterate from SGD --- batch-means estimator, which only uses the iterates from SGD. As the SGD process forms a time-inhomogeneous Markov chain, our batch-means estimator with carefully chosen increasing batch sizes generalizes the classical batch-means estimator designed for time-homogenous Markov chains. The proposed batch-means estimator allows us to construct asymptotically exact confidence intervals and hypothesis tests. We further discuss an extension to conducting inference based on SGD for high-dimensional linear regression.