Monte Carlo Techniques in Modern Stochastic Optimization for Big Data Machine Learning

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Abstract

Many optimization problems encountered in machine learning can be expressed as the minimization of a finite sum of individual loss functions. In recent years, a new class of stochastic optimization methods were developed to solve such problems. These new methods apply variance reduction techniques exited in the Monte Carlo literature to stochastic gradient descent, which lead to significantly faster convergence speed than classical algorithms in optimization. I will present a review of this class of methods, as well as some current directions.

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