RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES COLLOQUIUM

Nonconvex Nested Stochastic Optimization

Abstract: Nested stochastic optimization includes minimizing a composition of two (or more) smooth functions whose exact values and derivatives are not available. This class of problem arises in several machine learning problems such as low-rank matrix estimation, policy evaluation in reinforcement learning, and risk management. Unlike the classical stochastic optimization, the main difficulty in solving this class of problem is not having access to unbiased gradient estimators with bounded variance (or second moment).

In this talk, I will present a single time-scale stochastic approximation algorithm to find a stationary point of the class of two-level composition problem and show that, it achieves the same sample complexity as that of the stochastic gradient method for general smooth one-level nonconvex stochastic optimization. While this method provides an online reduced variance estimator for the gradient of the composite objective function, its convergence analysis is the same for both unconstrained and constrained problems, without any need of batch samples.

Saeed Ghadimi (Princeton University)

Monday, March 2, 2020 4-5pm

Amos Eaton 216

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge