



DEPARTMENT OF APPLIED MATHEMATICS

應 用 數 學 系

**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

**Seminar**

**Stochastic First-Order Methods in Data Analysis and Reinforcement  
Learning**

by

**Dr. Mendi Wang**

**Department of Operations Research and Financial Engineering,  
Princeton University**

**Abstract**

Stochastic first-order methods provide a basic algorithmic tool for optimization, online learning and data analysis. In this talk, we survey several innovative applications including online principal component analysis, network factorization, and reinforcement learning. We will show that the convergence rate analysis of the stochastic optimization algorithms provides sample complexity analysis for the corresponding online learning applications. In particular, we will show some recent developments on stochastic primal-dual methods that apply to both the Markov decision problem and its online version - reinforcement learning. We will show that both the running-time complexity for the offline problem and the sample complexity for the online problem can be analyzed under the same framework.

**Date : 5 June, 2017 (Monday)**

**Time : 1:00p.m. – 2:00p.m.**

**Venue : TU801, The Hong Kong Polytechnic University**

**\*\*\* ALL ARE WELCOME \*\*\***