SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

A GENERAL FRAMEWORK OF LARGE-SCALE CONVEX OPTIMIZATION USING JENSEN SURROGATES AND ACCELERATION TECHNIQUES

DISSERTATION DEFENSE
By

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Abstract: In a world where data rates are growing faster than computing power, algorithmic acceleration based on developments in mathematical optimization plays a crucial role in narrowing the gap between the two. As the scale of optimization problems in many fields increases, we need faster optimization methods that not only work well in theory, but also work well in practice by exploiting underlying state-of-the-art computing technology.

In the first part of this talk, I will introduce a unified framework of large-scale convex optimization using Jensen surrogates, an iterative optimization method that has been used in different fields since the 1970s. After this general treatment, I will present non-asymptotic convergence analysis of this family of methods and the motivation behind developing accelerated variants. The second part of the talk first reviews widely used acceleration techniques for convex optimization and then investigates acceleration techniques that can be used within Jensen surrogate framework while proposing several novel acceleration methods. In the last part, I show that proposed methods perform competitively or better than state-of-the-art algorithms for several applications such as Sparse Linear Regression (Image Deblurring), Positron Emission Tomography, X-Ray Transmission Tomography, Logistic Regression, Sparse Logistic Regression and Automatic Relevance Determination for X-Ray Transmission Tomography.

DATE: **Thursday January 21, 2016**
TIME: **2:00 pm**
PLACE: **Green Hall, Room 0120**

Dissertation advisor:
Dr. Joseph O'Sullivan

This seminar is in partial fulfillment
of the Doctor of Philosophy degree

Washington University in St. Louis
School of Engineering & Applied Science