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SEMINARIO

OPTIMIZACIÓN Y EQUILIBRIO

PRIMERA SESIÓN A LAS 16:30 hrs.

Expositor: Cristóbal Guzmán
Ph.D. Candidate in Algorithms, Combinatorics & Optimization
ISyE, Georgia Institute of Technology

Title:
Complexity in Convex Optimization: Oracles, Algorithms and Applications

Abstract:

The need to solve large-scale optimization problems is ubiquitous. Modern applications in signal processing, machine learning and big data, need at their core conv optimization solvers. In this respect, understanding the limits of performance of such methods is a crucial task.

In this talk we introduce the theory of oracle complexity as a standpoint to understand the efficiency of optimization algorithms. We will see how state of the art algorithms can be seen as oracle-based, and how the classical theory does not address current applications. Motivated by the later issue, we extend the theory of oracle complexity in two directions: First, we establish worst-case lower bounds smooth convex optimization over non-Euclidean domains. We derive nearly optimal lower bounds for smooth convex minimization over the L^1 ball, widely used in sparse signal processing; and the L^infinity ball, establishing the near optimality of the Frank-Wolfe method over this domain. Second, we extend complexity analysis to the distributional setting. We provide a unifying information-theoretic approach to derive lower bounds for average case oracle complexity based on a String-Guessing Problem, which is combinatorial in nature.
Finally, time permitting, I will present future directions of research in convex optimization and related areas.

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SEGUNDA SESIÓN a las 17:30 hrs,

Expositor :
Prof. Asen L. Dontchev
Mathematical Reviews and University of Michigan

Title: MPC Motivited Computational Optimization

Abstract.

I will start with a brief introduction to the paradigm of Model Predictive Control (MPC). Then I will discuss various enhancements of the Newton/SQP method motivited by MPC problems, such as modified and inexact Newton-type methods. Finally, I will talk about tracking solution trajectoris of parametric variational inequalities by using predictor-corrector path-following.

Miércoles 11 de Marzo del 2015, en la Sala Multimedia sexto piso, ubicada en Beauchef 851 Torre Norte.

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