THE UNIVERSITY OF CHICAGO | THE COMMITTEE ON COMPUTATIONAL AND APPLIED MATHEMATICS

Computational and Applied Mathematics Colloquium

Joint colloquium with the Department of Statistics

ERNEST RYU

Department of Mathematical Sciences
Seoul National University

Toward a grand unified theory of accelerations in optimization and machine learning

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Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

ABSTRACT

Momentum-based acceleration of first-order optimization methods, first introduced by Nesterov, has been foundational to the theory and practice of large-scale optimization and machine learning. However, finding a fundamental understanding of such acceleration remains a long-standing open problem. In the past few years, several new acceleration mechanisms, distinct from Nesterov's, have been discovered, and the similarities and dissimilarities among these new acceleration phenomena hint at a promising avenue of attack for the open problem. In this talk, we discuss the envisioned goal of developing a mathematical theory unifying the collection of acceleration mechanisms and the challenges that are to be overcome.

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