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DEPARTMENT OF STATISTICS

Joint colloquium with the Committee on Computational and Applied Mathematics (CCAM)

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 Avenue

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.