THE UNIVERSITY   **OF HONG KONG**

Institute of Mathematical Research
Department of Mathematics

Numerical Analysis Seminar

From ODE Solvers to Accelerated Optimization Methods

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Abstract

Convergence analysis of accelerated first-order methods for convex optimization problems are presented from the point of view of ordinary differential equation (ODE) solvers. We first take another look at the acceleration phenomenon via A-stability theory for ODE solvers and present an explanation by transformation of spectrum to the complex plane. After that, we present the Lyapunov framework for dynamical system and introduce the strong Lyapunov condition. Many existing continuous convex optimization models, such as gradient flow, heavy ball system, Nesterov accelerated gradient flow, and dynamical inertial Newton system etc, are addressed and analyzed in this framework. Finally we extend the acceleration to a class of non-linear saddle point problems.

This is a joint work with Hao Luo and Jingrong Wei.

Date:	June 21, 2023 (Wednesday)
Time:	10:00 – 11:00am
Venue:	Room 210, Run Run Shaw Bldg., HKU

All are welcome